ifo forschungsberichte
der afrika-studienstelle
23

The Development of Smallholder Vegetable Production in Kigezi, Uganda

by
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München 1969

Ifo-Institut für Wirtschaftsforschung · Weltforum Verlag

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1 sq.mile	=	2.59 sq.km	1 sq.km	=	0.3861 sq.miles
1 mile	=	1.61 km	1 km	=	0.621 miles
1 foot	=	0.3048 m	1 m	=	3.281 feet
1 lb	=	0.454 kg	1 kg	=	2.205 lbs.
1 acre	=	0.404 ha	1 ha	=	2.47 acres
1 yard	=	0.914 m	1 m	=	1.094 yards
1 inch	=	25.4 mm	1 cm	=	0.394 inches
1 ton+)	=	1.016 kg			
1 sq.yard	=	0.836 sq.m	1 sq.m	=	1.20 sq.yards
1 ounce	=	28.4 g	1 kg	=	35.3 ounces

+) all tons mentioned hereafter refer to "longtons" unless otherwise stated.

ACKNOWLEDGEMENTS

The study at hand has been undertaken at the suggestion of Dr. W. MARQUARDT, head of the African Studies Centre of the Ifo-Institute for Economic Research, Munich, and supported by a scholarship from the Fritz Thyssen-Foundation.

It could not have been realized without the assistance of the Kigezi vegetable growers, the vegtable co-operatives and the staff of the Kigezi Vegetable Scheme.

I appreciate sincerely the kindness of the Permanent Secretary of the Ministry of Agriculture and Forestry, Mr. J.S. LAKER and the Commissioner for Agriculture, Mr. H.R. BERUNGA, for granting permission to conduct the research, as well as to Mr. J.M. BYAGAGAIRE and Prof. D.G.R. BELSHAW for their valuable comments.

My thanks are due to the Makerere Institute for Social Research for electing me as Research Associate.

I am also grateful to the District Commissioner Kigezi, the Kigezi District Administration, the Kigezi District Agricultural Officer and the Kigezi District Co-operative Officer who all gave their support during the collection of data.

Furthermore, I want to thank Mr. D.C. MUTABAAZI, Assistant Agricultural Officer Hort., the Field Assistants of the Kigezi Vegetable Scheme and the Committee Members of the Kigezi District Vegetable Growers Co-operative Union Ltd. for their continued assistance in providing material.

Finally, I am endebted to Miss C. STEPHENSON for kindly correcting the English version.

F.L. SCHERER
Kampala, Uganda
January 1969

A. INTRODUCTION

The reasons for conducting the research about the Kigezi Vegetable Scheme were the following:

- A summary of the developments, results and experiences of vegetable growing in Kigezi should be submitted to the agricultural staff working in Kigezi, saving them the tiresome and timewasting study of the various files. During compilation of the material the relatively small District of Kigezi proved to be equipped with plenty of agricultural data. The continuous repetition of trials and measures within short periods indicated how poorly the agricultural officer in question had been informed of his predecessor's work and what an amount of time, money and effort had been wasted in searching out facts already at hand.

  These observations led to the detailed character of the first part which covers the general agricultural complex of the Kigezi District.

  It has to be noted that a systematical examination and summary of existing data, e.g. the agriculture at district level, would be a most urgent and valuable help for the administration in Africa, which in its effect has to be given preference over many of the present research projects, which are undertaken within the purview of institutes abroad.

  The development of vegetable growing of African smallholders under unfavourable marketing conditions provides an interesting study in regard to production and marketing. The results show that the need to exploit a source of income can overcome disadvantageous factors. The psychological attitude and the degree of financial dependence on a crop often play, particularly in Africa, a more essential

role in the success of a project than technical and marketing preconditions. The Kigezi example provides evidence in support of this contention.

- In a period of manifold critical arguments about the African co-operative movement a positive project has to be quoted to help correct some prejudice.

  Nobody will deny that in some African countries the co-operative idea has been pushed forward often because of political reasons and demands without the necessary experience, adequately trained staff or the consent of the farmers concerned. These faults together with too high promises and expectations have usually led to difficulties. False conclusions from these experiences resulted in the co-operative movement being interpreted as not adequate to African conditions.

- Although it was said of the Kigezi vegetable growers in 1965 that they could not make the co-operative idea work they are indicating in practice that it is not only these farmers' fault if the co-operatives fail. The method of introducing co-operative ideas, the extension staff in charge and the first empirical results, all have a great effect on the success of any co-operative project.

- As most of the investigations, which lead to the present publication, are kind of a by-product in connection with the realisation of an agricultural development project, the following has mainly to be regarded as a collection of often hardly accessible data best suited as background material for further analyses.

B. LOCATION AND HISTORICAL DEVELOPMENT

I. GEOGRAPHICAL LOCATION

The District of Kigezi is located in the extreme South-Western corner of Uganda. 1° 0' cuts the District into two nearly equal parts. 30° 0' East passes the District Headquarters in Kabale.

The areas bordering Kigezi are in the North = Lake Edward, West = Congo Kinshasa, South = Ruanda, and East = Ankole District of Uganda.

A similar range of continuously changing landscapes is hardly to be found within such a small area. With the six counties: Bufumbira, Kinkizi, Ndorwa, Rubanda, Rukiga, and Rhuzhumbura Kigezi covers only 2,039 sq.miles[1]. This is 2.2 per cent of the whole of Uganda (91,076 sq.miles)[2]. The total land area amounts to 1,902 sq.miles[3]. This number contains sleeping sickness areas, forest reserves, parts of Queen Elizabeth National Park, game reserves, land within boundaries of Kabale township, and other villages and areas which cannot be used for cultivation. Lake Edward Game Reserve, Queen Elizabeth National Park, and Malagambo Forest in North Kigezi total more than one fifth of the District area. Open water and swamps cover 137 sq.miles[4]. The lowest point of the District lies at Lake Edward: 2,995 ft. Muhavura, an extinct vulcano, which belongs to the Mfumbira Mountains is, at 13,547 ft, the highest elevation in Kigezi.

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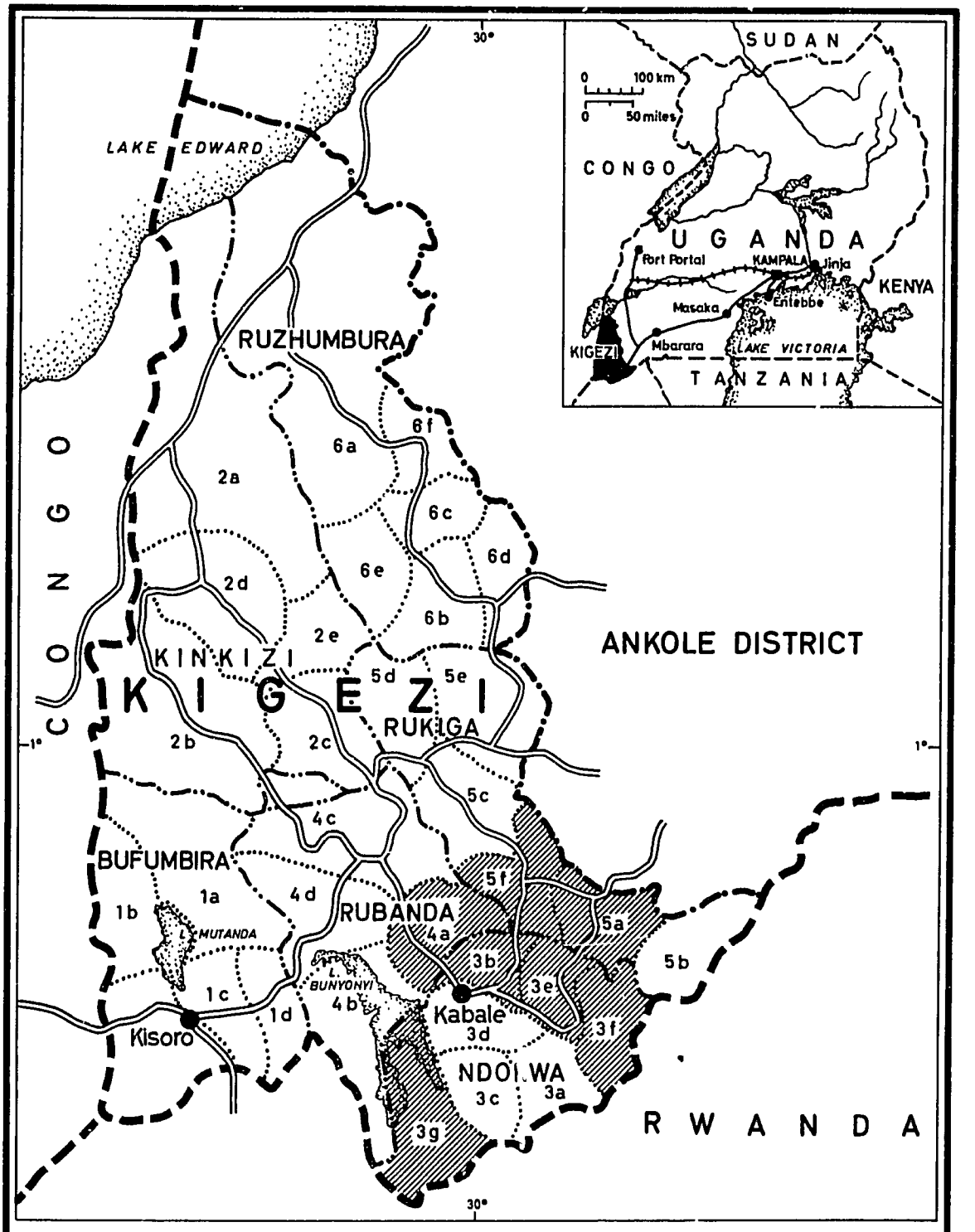
1) Ug.Gov.: 1966 Statistical Abstract. Entebbe, p.1 (furtheron quoted as Stat. Abstr. 1966).

2) Ug.Gov.: Stat. Abstr. 1966, loc. cit., p.1.

3) Ug.Gov.: Report on Uganda Census of Agriculture. Vol. III, 1966, p.17 (furtheron quoted as Rep.on Ug.Cens. of Agr.).

4) Ug.Gov.: Stat. Abstr. 1966, loc. cit. p.1.

Map 1: Kigezi District with Counties and Sub-Counties



SUBCOUNTIES:

1. BUFUMBIRA
- a. BUKIMBIRI
- b. BUSANZA
- c. CHAHI
- d. NYAKABANDE
- e. NYARUSIZA

2. KINKIZI
- a. KAMBUGA
- b. KAYONZA
- c. KINATA
- d. KIRIMA
- e. RUGYEYO

3. NDORWA
- a. BUHARA
- b. KABALE
- c. KAMUGANGUZI
- d. KITUMBA
- e. KYANAMIRA
- f. MAZIBA
- g. RUBAYA

4. RUBANDA
- a. BUBALE
- b. BUFUNDI
- c. IKUMBA
- d. MUKO

5. RUKIGA
- a. BUKINDA
- b. KAMWEZI
- c. KASHAMBYA
- d. NYAKISENYI
- e. NYAARUSANJE
- f. RWAMACUCU

6. RUZHUMBURA
- a. BUGANGARI
- b BUYANZA
- c. KAGUNGA
- d. KEBISONI
- e. NYAKAGEME
- f. RUHINDA

INTERN. BOUNDARY
DISTRICT BOUNDARY
COUNTY BOUNDARY
SUBCOUNTY BOUNDARY
VEGETABLE GROWING SUB-COUNTIES
MAIN ROADS

0 10 20 30 km
0 5 10 15 miles

Moist semi-decideous forests (Malagambo) change into savanna woodland, moist montane forests (around Ikumba and Kayonza) into ericaceous montane forests, crater lakes (Bufumbira) or hot springs (Ruzhumbura) and large swamps can be found in the District as well[1]. Justifiably Kigezi can be called a district of contrasts[2].

II. POPULATION

The four districts Ankole, Bunyoro, Kigezi, and Toro comprise the Western Region of Uganda with the administrative centre in Fort Portal. The population of this region belongs mainly to Bantu-Tribes. Kigezi District has with its 534,162 inhabitants[3] a population density of 281 per sq.mile[4].

Uganda's population was estimated at 7,740,000, the density at ca. 100 per sq.mile[5]. In the population census year 1959 the density for Kigezi was 260 per sq.mile, and for Uganda 86 per sq.mile[6].

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1) J.M. BYAGAGAIRE: A Summary of Agriculture in Kigezi District, Western Region, Uganda Mimeo., p.1 (furtheron quoted as: A Summary of Agr. in Kigezi). H. BERGER: Uganda. Bonn 1964, p. 14. I. LANGDALE-BROWN: The Vegetation of Uganda, Kampala 1960, p.32. UG.GOV.: Atlas of Uganda. Department of Lands and Surveys, Entebbe 1962, p.24.

2) J.M. BYAGAGAIRE: A Summary of Agr.in Kigezi, loc.cit., p.1.

3) UG.GOV.: Rep.on Ug.Cens.of Agr., loc.cit., Vol. I, p.22.

4) UG.GOV.: Stat.Abstr. 1966, loc.cit., p.5.

5) UG.GOV.: Stat.Abstr. 1966, loc.cit., p.5.

6) UG.GOV.: Stat.Abstr. 1966, loc.cit., p.7.

Table 1. Population Census, 1959: Land area, Population, and Population Density by Region and District

Region and District		Land Area in sq. miles	Population	Density per sq.mile
Buganda	East Mengo	5,101	612,640	120
	West Mengo	4,588	725,255	158
	Masaka	3,781	443,877	117
	Mubende	2,668	99,377	37
Total		16,138	1,881,149	117
East	Bugisu	931	304,075	327
	Bukedi	1,575	400,432	254
	Busoga	3,443	677,410	197
	Mbale Town	9	13,569	1,508
	Teso	4,306	457,875	106
	Sebei	671	49,336	74
Total		10,935	1,902,697	174
North	Acholi	10,783	286,846	27
	Karamoja[a)]	10,828	172,397	16
	Lango	4,464	354,311	79
	West Nile	4,147	385,019	93
	Madi	1,717	50,737	30
Total		31,939	1,249,310	39
West	Ankole	5,928	531,335	90
	Bunyoro	4,723	128,198	27
	Kigezi	1,902	494,488	260
	Toro	4,745	349,354	74
Total		17,294	1,503,375	87
Grand Total		76,310	6,536,531	86

a) including Karasuk.

Source: UG.GOV.: Stat.Abstr. 1966, loc.cit., p.7.

Table 2. Population Expansion in Kigezi, 1911 - 1965

Year	Population, Kigezi
1911	100,000 (estimated)
1921	206,090 (Census)
1931	225,892 (Census)
1948	420,098 (Census)
1959	493,444 (Census)
1965	655,322 (estimated)

Source: UG.GOV.: Stat.Abstr. 1966, loc.cit., p.7. J.M. BYAGAGAIRE: A Summary of Agr. in Kigezi, loc.cit., p.3.

Table 2 illustrates the population expansion in Kigezi. Within the last thirty years Kigezi's population has nearly trebled.

Table 3. Population Census 1959: Kigezi, Land Area Population and Population Density by County and Sub-County

County and Sub-County		Land Area in sq. miles	Population	Density per sq.mile
Bufumbira[a]	Bukimbiri	93	17,053	183
	Busanza	55	17,109	311
	Chahi	33	15,704	476
	Nyakabande	34	23,011	677
	Nyarusiza	53	22,351	422
Total		268	95,228	355
Kinkizi	Kambuga	221	19,211	87
	Kayonza	141	9,495	67
	Kinaba	71	5,770	81
	Kirima	64	14,252	223
	Rugyeyo	28	8,211	293
Total		527	56,939	108
Ndorwa[b]	Buhara	22	17,420	792
	Kabale (x)	18	10,966	609
	Kamuganguzi	21	15,022	715
	Kitumba	29	15,689	541
	Kyanamira (x)	28	23,088	825
	Maziba (x)	43	18,147	422
	Rubaya (x)	47	20,224	430
Total		208	120,556	580
Rubanda	Bubale (x)	44	20,344	462
	Bufundi	37	14,669	396
	Ikumba (x)	58	22,579	389
	Muko (x)	44	10,927	248
Total		183	68,519	374
Rukiga	Bukinda (x)	36	13,159	366
	Kamwezi	44	11,228	255
	Kashambya	46	12,646	275
	Nyakishenyi	48	12,328	257
	Nyaarushanje	64	13,918	217
	Rwamacucu (x)	39	17,735	455
Total		277	81,018	292

(cont'd)

Table 3. (cont'd)

County and Sub-County		Land Area in sq. miles	Population	Density per sq.mile
Ruzhumbura	Bugangari	271	9,940	37
	Buyanza	34	12,757	375
	Kakunga	31	14,877	480
	Kebisoni	35	12,068	345
	Nyakageme	33	12,705	385
	Ruhinda	36	9,894	275
Total		440	72,241	164
Grand total Kigezi		1,902	494,488	260

a) See: Map 1

b) Sub-Counties denoted by (x) are partly belonging to the Kigezi Vegetable Scheme.

Source: UG.GOV.: District Files, Kigezi

Table 4. Kigezi 1965: Population and Population Density by Counties (estimated)

County	Population	Population Density per sq.mile
Bufumbira	116,869	401
Kinkizi	80,529	161
Ndorwa	148,621	663
Rubanda	95,089	364
Rukiga	92,407	327
Ruzhumbura	121,807	273
Kigezi	655,322	345

Source: UG.GOV.: District Files, Kigezi

Sub-County Kyanamira in Ndorwa County has the highest population density in Kigezi. It is situated east of Kabale, which in its function as district town represents the features of a centre. The high density along the Ruanda boundary shows the continuous migration from Ruanda into Kigezi.

Table 5. The African Population in Uganda and Kigezi by Sex and Age Group (over 16 = adult)

	Adult	Male Children	Total
Uganda	1,823,686	1,413,216	3,236,902
Kigezi	91,529	135,701	227,230

	Adult	Female Children	Total
Uganda	1,819,859	1,392,797	3,212,656
Kigezi	129,058	137,157	266,214

Source: UG.GOV.: Stat.Abstr. 1966, loc.cit., p.8.

In Kigezi the females outnumber the males. There are several reasons. One is that overpopulation, lack of land, and scarcity of paid labour force many younger, often unmarried males to emigrate for a short period or for good to other areas, preferably Buganda and Kilembe mines. This fact has an opposite effect on the sex ratio, e.g. in Buganda 991,945 males and 842,183 females[1].

Table 6. Holders by Location

	Total Number of Holders	Present all Year	Away 1-3 Months	Away more than 4 Months
Uganda[a]	1,170,921	1,075,317	43,412	52,192
Kigezi	85,671	71,358	3,791	10,522

a) excluding Karamoja and Toro

Source: UG.GOV.: Rep.on Ug.Cens.of Agr., loc.cit., Vol.I, p.22 and p.36.

1) UG.GOV.: Stat.Abstr. 1966, loc.cit., p.8.

Table 7. Percentages of Holders Absent from Holding

Region	Holders absent one month or more %
Uganda[a)]	8.2
Buganda	5.6
East Region	3.9
North Region[b)]	9.9
West Region[c)]	18.7
Kigezi	16.7

a) excluding Karamoja and Toro
b) excluding Karamoja
c) excluding Toro

Source: UG.GOV.: Rep.on Ug.Cens.of Agr., loc.cit., Vol.I, p.37.

In Uganda about sixty per cent of the holders who were absent from their holdings for four or more months came from Ankole and Kigezi Districts of Western Region[1)]. The people living in mountainous areas are used to more tiring work and are thus in demand as labourers. MEREDITH, a teagrower in Toro, "..said emphatically that the tea industry in Toro would never have survived with only Batoro to work it. It was the hard-working, laughing Bakiga from the hills of Kigezi who made it possible.."[2)].

Except for the small group of merchants, school and church teachers, officers etc. the majority of the population is engaged in agriculture in Kigezi. There are three main tribes[3)]; the Bakiga, the Banyaruanda and the Bahororo. The Bakiga live in the more hilly areas of the District, in the counties of Ndorwa, Rukiga, Rubanda, parts of Kinkizi, and the resettlement

1) UG.GOV.: Rep.on Ug.Cens.of Agr., loc.cit., Vol. I, p.37.

2) H. INGRAMS: Uganda, A Crisis of Nationhood. London 1960, p.234.

3) See table 8.

areas of Ruzhumbura. They are mostly engaged in agriculture. The Banyaruanda inhabit Bufumbira county and can be found along the Ruanda boundary as well They fall into two classes, the Bahutu, mainly agriculturists, and the Batutsi, who are chiefly pastoral farmers.

The same applies to the Bahororo, living in Ruzhumbura County and the adjoining parts of Kinkizi County, who consist of the agricultural Bairu and the pastoral Bahima. There are no clear lines between the different groups of the Banyaruanda or Bahororo. If an agriculturist owns enough cattle he will tend to concentrate on livestock. On the other hand if the loses his cattle the holder will return to agriculture or leave his place to find a job in another part of Uganda as herdboy or worker to earn his living[1].

In Kigezi class or tribal problems are only slight. This fact has contributed considerably to the quick development of the District.

II. HISTORY

Since in Kigezi, as in many other parts of Tropical Africa, no written sources are available, the study of history encounters some difficulties.

1. THE FIRS' INHABITANTS OF THE DISTRICT

The population of Kigezi consists of a number of tribes who come from different origins.

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1) J.M. BYAGAGAIRE: A Summary of Agriculture in Kigezi, loc.cit., p.3.

Table 8. The Main Tribes in Kigezi, Census 1959

Tribe	Population
Bakiga	386,739
Banyaruanda	102,875
Others	3,948
Total	493,444

Source: UG.GOV.: Stat. Abstr. 1966, loc.cit., p.11.

The Bakiga are the main tribe. Their arrival in Kigezi from the South cannot be precisely specified. According to INGRAMS the first Bakiga from Ruanda immigrated into Kigezi between 1800 and 1850.

The first inhabitants of Kigezi had been the Abashambo, related to the Bahima and like all Hamites, cattle men. The increasing population and the rule of the Batutsi forced more and more Bakiga out of Ruanda. At first, the Bakiga recognized the Hamites as superiors but as their numbers increased they drove them northwards into Ruzhumura and Ankole[1]. ROSCOE describes the Bakiga as "...a wild set of people without any cohesion or regard for authority..."[2]. They had never had a ruler. The tribe was split into clans living independently from each other and being governed by their elders[3]. MUKHERJEE notes"...even if the tribal life had not yet been superseded by a higher stage of social organization, it was at least in the process of desintegration..."[4].

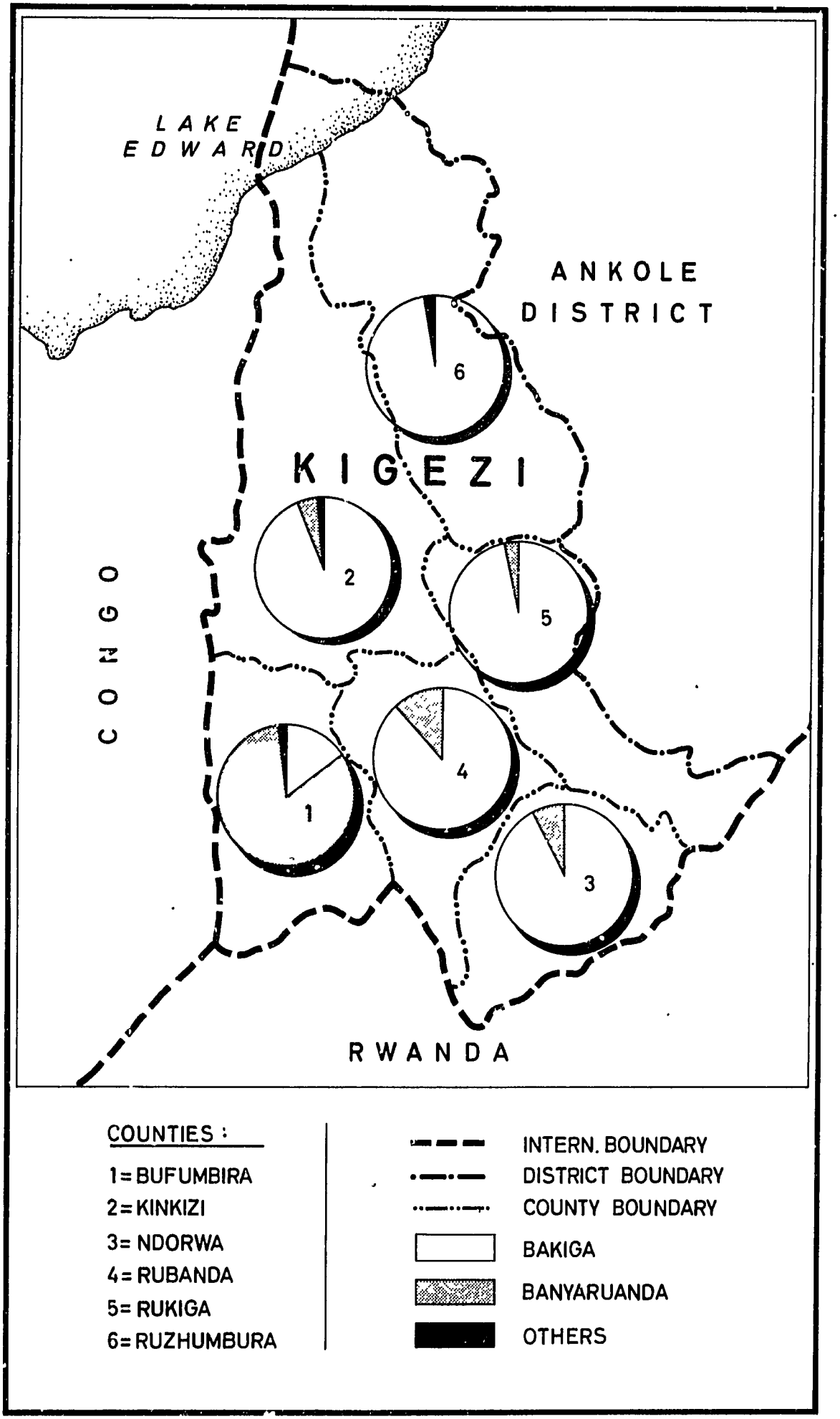
1) H. INGRAMS: loc.cit., p. 211. P.W. and K.H. BELL: African Economy Problems, Vol.III, Makerere University College, Kampala 1965.

2) J. ROSCOE: The Soul of Central Africa. London 1922, p.102.

3) H. INGRAMS: loc.cit., p.212. J. ROSCOE: loc.cit., p.102. A.I. RICHARDS: East African Chiefs. London 1959, p.283. M.M. EDEL: The Chiga of Western Uganda. New York 1957, p.2. R. MUKHERJEE: The Problem of Uganda. Berlin 1956, p.82. R. YELD: Land Hunger in South-West Uganda. Nkanga Edition 3, Kampala, p.24

4) R. MUKHERJEE: loc.cit., p.84.

Map 2: The Main Tribes in Kigezi by County



The Hamitic Batutsi inhabited Bufumbira forming together with the more numerous Bahutu[1] the Banyaruanda[2].

Similarly the Hamitic Bahima, who had partly been driven to the North by the immigrating Bakiga and the agricultural Bairu make the Bahororo. The Bahima of North-Kigezi belonged once to the Bahima of Ankole kingdom. They split off and founded their own kingdom in North-Kigezi.

2. THE ARRIVAL OF THE FIRST EUROPEANS AND THE INSTALMENT OF THE BRITISH ADMINISTRATION

EMIN PASHA and STUHLMANN were the first Europeans who reached Kigezi. They passed through North-Kigezi in 1891[3]. Parts of the present district belonged until the Brussels Convention[4] to German-East-Africa and to Congo Free State[5]. Kigezi was one of the last districts in Uganda to come under British administration. The British officer SULLIVAN erected a station in Kumba in 1910[6].

J. MC DOUGALL, the first British District Commissioner, arrived in Kigezi 1913. 1914/15 Kabale became administrative centre of the District. The British administrators had to encounter the following problems:

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1) W.R. LOUIS: Ruanda-Urundi 1884-1919. Oxford 1963, p.3.

2) Banyaruanda can be found all over the District, see map 2. H. INGRAMS: loc.cit., p.212.

3) F. STUHLMANN: Mit Emin Pasha ins Herz von Afrika. Berlin 1894, p.258.

4) The official title was: Conference respecting Frontiers between Uganda, German East Africa and the Belgian Congo (see: LOUIS).

5) UG.GOV.: Atlas of Uganda. Entebbe 1962, p.74, W.R. LOUIS: loc.cit., p.79 ff.

6) UG.GOV.: District Files, Kigezi.

- Some local chiefs tried to oppose the encroachment upon their powers[1].
- The First World War involved Kigezi between 1914 and 1916 in activities resulting in occupation by Belgian troups.
- A strong religious movement, the Nyabingi cult, caused troubles until the end of the twenties[2].
- 1917/18 a rebellion arose mainly around Nyakageme against the officers from Buganda. This led to a change in the administrative policy, opening the door to the appointment of local officers. With the beginning of the thirties all lower governmental posts were held by residents.

African church teachers started missionary activities in Kigezi in 1913/14. In 1921 efforts were intensified when the first European missionaries, Dr. SMITH and Dr. SHARP from the C.M.S.[3] took up work in the district by erecting a hospital in Kabale and schools.

The first White Fathers Fr. LACENE and Fr. NICOLE followed 1923 and they were at first engaged in building schools and a church[4]. The chapter above has given a brief outline of the situation existing before the first District Agricultural Officer was appointed to Kigezi. Within the following summary of the agricultural development historical data are mentioned when necessary.

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1) K. INGHAM: A History of East Africa. London 1965, p.230.

2) V. HARLOW and E.M. CHILVER: History of East Africa. Vol.II. Oxford 1965, p.104.

3) C.M.S. = Christian Mission Service.

4) UG.GOV.: District Files, Kigezi.

3. SUMMARY OF THE AGRICULTURAL DEVELOPMENT IN KIGEZI[1)]

1891 STUHLMANN found the following subsistence crops in Kigezi: plantain (Musa paradisiaca), bean (Phaseolus vulgaris), pea (Pisum sativum), fingermillet (Eleusine corocana), marrow (Cucurbita pepo), maize (Zea mays), sorghum (Sorghum vulgare) and sweet-potato (Ipomea batatas)[2)].

1913/14 The first District Commissioner mentioned as principle crops: bean, pea, fingermillet, maize, sorghum, sweet-potato.
The Population: The Bakiga are a thickly populated race with a very fine physique.
English vegetable grow well.
Coffee (Coffea spp.): A few trees planted at Bukinda and some other places.

1914/15 Experimental: Wheat (Triticum aestivum) plots, Black Wattle (Acacia decurrens var. mollissima) grow remarkably well.

1915-1918 Wheat: 125 plots planted
Buckwheat (Fagopyrum esculentum) proved a success.
Neither eucalyptus (Eucalyptus spp.), cotton (Gossypium spp.), simsim (Sesamum indicum), groundnut (Arachis hypergaea) nor chilly (Capsicum spp.) were grown successfully.
Orange (Citrus spp.): near Nyaarushanje.
Strawberry: at Kabale[3)].
Bee-keeping: very common
Hides: main export article.

1918/19 Barley (Hordeum vulg.) and oats (Avena sativa) have been reaped. Barley by far the best crop.
Groundnut: succeded in Ruzhumbura.
Upland Rice (Oryza sativa): trials started.

1919/20 Rice: successful.
Lucerne (Medicago sativa): successful.
Wheat: marketing problems, the erection of a mill proposed.
Rinderpest in South-West Rukiga.
Cassava (Manihot utilissima) and groundnut introduced in Ruzhumbura.

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1) With the exception of the separately quoted sources the information was obtained from the District Files, Kigezi.

2) F. STUHLMANN: loc.cit., p. 254, 258, 260, 659.

3) J. ROSCOE: loc.cit., p. 108.

1921 Cotton: experiments with little success, marketing problem.
Communal finger-millet plots and food storage measures against famine in each sub-county.

1922 Cotton: experiments discontinued.
Sweet-potato: cultivation steadily spreading.
Plantain: in Ruzhumbura, Kinkizi and warm parts of Rukiga.
Indigenous chilly in North-Kigezi. First chilly seed (Capsicum spp.) distributed.
Famine granaries introduced.
Urge to plant trees for fuel: every farmer should have his field ("shamba") of Black Wattle.
Hides and skins trade stagnant (sh. 9 per hide).

1923 Chilly: production increased and with propaganda a large acreage was put down in Ruzhumbura.
Luffa (Luffa aegyptiaca): cultivation not encouraging.
Tobacco (Nicotiana spp.): grown in various parts of the District.
Sugar cane (Saccharum officinarum): introduced at several places.
Agricultural Conference decided to intensify cotton and coffee production in Kigezi.
Establishment of market gardens proposed.

1924 "Propaganda has been extensively circulated to encourage the natives to establish market gardens for the sale of food and although in a few cases natives have taken it up with keenness even growing various English Vegetables they are however the exception than the rule."
Three men trained for plough-cultivation in Masaka.
One man from each county was sent to Masaka for a course of training in cotton and coffee cultivation.
Besides the chief crops (sorghum, fingermillet, pea, bean, sweet-potato) a certain amount of sugar cane, tobacco, simsim, groundnut, arrow root (Maranta arundinacea), chilly, plantain, potato-sol. (Solanum tuberosum) and wheat were also grown.
Cotton: experimental plots planted in Ruzhumbura, Kinkizi and Rukiga.
Coffee: big seed beds planted at each sub-county headquarter. Everywhere good results except Bufumbira.
Potato-sol.: many Africans gradually got to like it and considerable quantities are produced.

1925 Comment of the new District Commissioner: "...these Bakiga cling to their own old customs and are incredibly slow and stupid in adopting other ways even when the advantages are ocularly demonstrated to them. Until such time as they can be taught how to grow food

crops it is useless to think of trying any economic crops in this District even if a paying market for such could be found..."
First ploughs for cultivation with oxen introduced. Tea (Camellia sinesis): Trials at Kabale and Rukungiri.

1926 Every tax payer required to plant 20 trees annually.
Sorghum: 80 per cent of the grains are estimated to be used for beer.
Sweet-potato: Production in Bufumbira improved as well.

1927 Coffee: Production increasing.

1928 Quinine (Chinchona spp.): trials.

1930 The main trading centres in Kigezi were: Kabale, Kisoro and Rukungiri.
Communal granaries regularly inspected.
Draining of swamps intensified, unpopular work. Planting of eucalyptus into swamps.
Tree planting continued, 20 trees per household and year.
Coffee: "...is doing well in some places and it is high time to consider how to dispose of it..."
Quinine: plantation did well.
Rice: prospered in certain localities.
Sisal (Agave sisalana): trials.
Tea: trees were not thriving as it was hoped.

1931 Communal Granaries: 18 lb. of finger millet per head of the population stored.
Coffee: First buying = 1.5 tons at 0,14 - 0,18 sh./lb.

1932 Ravages of locusts.
"...the cost of transport would kill any other than a high priced and small-bulked commodity and whereas it was seen that a produce as wheat, sisal and other crops might certainly thrive well, yet there could never be another than a local market for them."
A new bee-hive introduced in view of the possible introduction of a bees-wax industry.
Coffee: Antestia (Antestia infestans) gained a firm hold.
Wattle tree: Inquiries into a Wattle-bark industry.

1933 Rinderpest in Bufumbira.
The weed "mpunika" (Galinsoga parviflora) said to have spread to the District about 1927/28 was found everywhere.
Cotton: trials discontinued.
Potato-sol.: Growing in popularity on account of the fact that they come to maturity more quickly at these altitudes than the sweet-potatoes.
Sweet-potato: planted in swamps.
Wheat and rice: did not develop into export crop, only local consumption.

1934/35 The first District Agricultural Officer, R.T. WICKHAM, posted to the District, as from 8th August 1934.
Assignment of two African bee-keeping instructors.
2,000 private bee hives in the District. Bees wax = 0.50 sh./lb.
Cropping: on an average of four years out of five, twice a year. During fallow heavy grazing by cattle, sheep and goats.
Coffee: 1,224,000 coffee plants in the District.
Sorghum: storing trials.

1936 A high percentage of males are working in Buganda.
Potato-sol.: seed from Kenya to improve the existing stock.
Peppermint (Mentha piperita): trials started.

1937 Experimental Farm in Kachwekano opened, essentially a sheep farm (wool) and trial station.
A number of School Gardens started.
Soil-erosion: Increased attention given to the problem, anti-erosion lines across the hill slopes, contour stop-wash hedges ("contour hedges").
Hedging experiments with local shrubs in the study of anti-erosion measures.
Coffee: Antestia reached Ndorwa-County. Antestia source of high losses.
Experimental: Tannia (Xanthosoma sagittifolia), Cassava "Node wide", Tobacco.

1938 Soil-erosion: African Agricultural Assistants and Instructors occupied in getting the cultivators to plant strips of Elephant grass (Pennisetum purpureum), Erythrina (Erythrina spp.) and other plants across the slope at the bottom or in the middle of their plots.
Coffee: In worst Antestia infested areas introduction of Robusta Coffee.
Sweet-potato: Growing on ridges across the slope common. Planting in swamps during dry season intensified.
Experimental: Finger-millet, Oat, Cabbage (Brassica oleracea), Swede (Beta napus var. napobrassica), Lentil (Lens esculenta), Maize, Mangold (Beta vulg. var, cicla), Rice, Soya bean (Glycine max.), Tea, Tepary bean (Phaseolus acutifolius), Pigeon pea (Cajanus cajan), Lemon Grass (Cymbopogon citratus), Vetivert Grass (Vetiveria zizanioides), Pyrethrum (Chrysanthemum cineraiefolium), Apple (Pirus malus), Sweet Orange (Citrus sinensis), Avocado Pear (Persea grat.), Mountain Paw-paw (Carica candamarcensis), Cape Gooseberry (Physalis peruviana), Guava (Psidium guyava), Raspberry (Rubus idaeus), Tree Tomato (Cyphomandra betacea), Lemon (Citrus limonia).

1939 Soil erosion: Contour planting and hedging continued.
Campaign for controlled grass burning a success.
Second Maize mill in the District.
Pea: Marrow fat seed distributed to the farmers.
Experimental: Lucerne, Turnip (Beta rap. var. rap.), Kale (Brassica ol.laciniata), Rape (Brassica rapa, var. ol.), Paspalum (Paspalum spp.), Passionfruit (Passiflora edulis), Key Apple (Aberia caffra), Grape Vine (Vitis vinifera).
Pyrethrum: trials successful.

1940 Kigezi without District Agricultural Officer.
Communal Granaries abolished.
Coffee: Arabica uprooted in main infested areas due to Antestia.
Pyrethrum: Plantations run by Europeans in Bisika, Mpalo and Kanaba: 470 acres.
Kachwekano Experiment Farm: seed multiplication
Experimental: Quinine, Nicotin Tobacco (Nicotiana rustica, Flax (Linum usitatissimum).

1941 Kigezi without District Agricultural Officer.
Coffee: In Bufumbira great demand for Coffee-seedlings.
In the District:
C. Arabica = 1,572,633 trees
C. Robusta = 138,344 trees
Nicotin Tobacco: 44 acres planted, sold for 0.10 sh./lb. to European Enterprises.
Potato-sol.: Export to Buganda.
Experimental: Flax trials a success.

1942/43 Staff of the District Agricultural Office Kabale:
1 District Agricultural Officer,
1 Flax Advisor,
1 Tobacco Advisor
33 African Agricultural Assistants
Export embargo on food crops out of Kigezi.
Drainage of Kashambya and Maziba swamps.
Nicotin Tobacco and Flax are commercial crops now.
Nicotin Tobacco : 1941 = 44 acres
1942 = 250 acres
Factory for nicotine extraction built by European Enterprise in Kigata, 4 miles Mbarara Road.
Flax: Spring 1942 = 86 acres
Autumn 1942 = 310 acres
Spring 1943 = 520 acres
Potato-sol.: Heavy Blight (Phytophthora infestans) attacks reduce production.
Wheat: 320 acres.
Experimental:Efforts to produce English Vegetable seeds in quantity to endeavour to make Uganda self-supporting in this: Cabbage, Carrot (Daucus carota), Leed (Allium ampeloprasum), Lettuce (Lactuca sativa), Onion (Allium

cepa), Cauliflower (Brassica ol.var.cau.), Chinese Cabbage (Brassica pekinensis), Beetroot (Beta vulg. var.rap.). Results disappointing, the climate and light conditions are not suitable.
Castor Seed (Ricinus communis) and Quinin: 1 acre.

1944/45 "Native Council" established.
"Committee on Overpopulation" in Kigezi installed.
All cattle vaccinated against Rinderpest (death rate: 10 to 20 per cent).
Improvement in contour hedging.
Coffee: Interest in growing decreasing because of Antestia.
Pyrethrum: Plantations have difficulty in finding labour.
Experimental: Broad Bean (Vicia faba) very good results in yield. In Kachwekano trials for vegetable seed production and sheep-breeding abandonned.

1945/46 Soil erosion: intensive measures, "Soil Conservation Competition" introduced, alignment of plots on to strips, control of grass burning, contour lines of Black Wattle on very steep grazing areas, compost making.
Resettlement Scheme started.
Flax and Nicotine Tobacco: production further increased.
Experimental: Fertilizer (Phosphate) trials, Sunflower (Helianthus annuus) introduced, Groundnut, Simsim, Soya bean and Cassava reintroduced.

1946 No permits issued to purchase primary produce in Kigezi.
Food crops harvested were the best for several years.
Resettlement: 1500 men, women and children permanently moved to North-Kigezi.
Onion: 100 acres planted in Bukinda.
Seeds from Kachwekano distributed.
Soil conservation: Pennisetum clandestinum, Cynodon plectostachyum, Digitaria swazilandis, Cynodon transvalensis most useful.
Experimental: Crataegus crenulata and Aberia caffra as hedge plants fully stock-proof.

1947 New orchard started in Kachwekano. Fruit plants from 1938 were moved to the new site. Peach (Prunus persica, Plum (prunus domestica), Fig (Ficus carica), Avocado Pear, Grapefruit (Citrus paradisi), Organge, Lemon, Lime (Citrus aurantifolia), Tangerine (Citrus aurantium), Mandarine (Citrus nobilis), Cherimoya (Annona cherimolia), Pineapple (Ananas sativus).

1948 Soil erosion: "Under Local Law and Custom it is universally accepted that erosion measures are obligtory."
Compost pits: Use regarded as compulsory.
Swamp drainage: Opposition against further drainage in some areas.
Flax: diseases started, Plasmo disease (Sphaerella linorum), Mildew, Fusarium.
Pyrethrum: One plantation closed down.
Sunflower: Expanding, regarded as cash-crop.
Wheat: Only local consumption.
Experimental: "...One reaches the conclusion regretfully, that Kachwekano and the Kabale area are not suited for fruit growing with the possible exception of peaches. The area however produces magnificent vegetables...".
Potato-sol. trials.
African apprenticeship scheme at Kachwekano.

1949 Statutory recognition of the Kigezi District Council.
Transfer to the Local Government of certain services and African technical staff.
Building up homestead food reserves: 30 lb. of fingermillet and peas per head of population. In addition fingermillet stored in sub-county famine granaries.
Grassing of house compounds, zigzagging bunding and planting of cattle tracks.
Competition for the best school gardens.
Marketing of crops other than Nicotin Tobacco, Flax and Coffee arranged by means of permits issued under the native Foodstuffs Ordinance.
Swamp reclamation: Kashambya swamp brings high crop yields and excellent grazing on the planted Kikuyu Grass pastures.
District Council's dislike of any reference to swamp drainage.
Coffee: interest growing in Ruzhumbura and Kinkizi.
Flax: disappointing because of plasmo-disease.
Nicotin Tobacco: 3,050 acres, average nicotine content = 9.44 per cent. The Nicotin Tobacco crop is believed to cause serious mortality among the bee population, thereby reducing it greatly.
Experimental: Air-cured Tobacco in North-Kigezi. Wheat, Barley, Oats and Potato-sol. variety trials.

1950 "...It is becoming increasingly obvious that the soil conservation work, the improvement of soil fertility by composting and resting fallow and the reduction of the population on the land in East-Ndorwa and South-Rukiga by the resettlement scheme are having a cumulatively beneficial effect on the local food production and on the yields of crops...".
"...the limited amount of land coupled with the difficulty of finding a high priced crop which will grow in Southern Kigezi where most of the people live and will withstand the cost of the long road haul to railhead are the chief drawbacks to increased economic production...".

Export permits during the year granted only for: Groundnuts, maize flour, Onions, Potatoes, Sunflower seed and Wheat.
Formation of a "Stock Farmers Association" in Kabale.
Potato-sol.: heavy attacks of Phytophthora infestans.
Black Wattle: serious source of erosion, planting in contour lines at least 16 yd. or more apart.
Experimental: herd of hornless "nkungu" cattle in Kachwekano.

1951 Swamp reclamation: in Buhara and Kamunganguzi area.
Resettlement: first settlers from Kigezi to Ankole under governmental help.
Black Wattle: bark placed on the schedule for the Native Produce Marketing Ordinance to control, ten buying centres in the District.
Castor seed: first export.
Chilly: 50 bags exported.
Flax and Nicotine Tobacco: Production decreasing.
Maize: grown on a increasingly large scale in the North, enhanced production of beans due to interplanting.
Potato-sol. and Onion: export increased considerably.
Vegetable: a Vegetable Scheme started to supply the Kampala market, transporters are Kigezi Industries Ltd.
Experimental: Cho-cho (Sechium edule), Cucumber (Cucumis sativus), Marrow (Cucurbita pepo), Citrus trials without success, suffering from zinc and magnesium deficiency.

1952 Areas in North-Kigezi included in a National Park: Queen Elizabeth National Park.
Extension: Between 1946 and 1952 ten agricultural courses have been held, attended by ca. 600 persons.
Oxalis semiloba: well established troubleseome weed around Kabale.
Cassava: increase in the acreage of the mosaik-resistant variety in North-Kigezi and the lower parts of Rukiga.
Coffee: Kent's arabica heavily infested by Hemil ia vastatrix.
Sweet-Potato: Virus disease.
Vegetable: growing restricted to an area within 12 miles from Kabale.
Experimental: vegetable trials see chapter D,II,1,d.
Kachwekano concentrating on milk production.

1953 Frost within a 30 miles radius around Kabale = 3.3 degree C. (38.0 degree F.).
Agricultural Legislation: District Team decided that by-laws are not desirable.
Co-operative movement: attempt of the vegetable growers to form a co-operative society.

1954 Air survey of the whole District.
Foundation of the "Kigezi African Traders Association".
Fishing industry in the North of the District.
Introduction of block cultivation in North Kigezi and lower parts of Rukiga.
Rotational grazing and night paddocking started.
Swamp reclamation: drainage experiments in utilisation of "dead patches".
Pyrethrum: plantation, the only non-African estate in Kigezi, reverted to African trust.
Nicotine Tobacco: production of extract stopped in Kigata.
Tobacco, flue-cured: promising start in Bugangari, N-Kigezi.
Experimental: Rice in the Bwindi-Swamp, variety trials of strawberries, grasses, legumes, Geranium (Pelargonium capitatum and P.radula).

1955 District Council: drawing up of an outline scheme for the intensification of agriculture and the posting of additional "Field Officers, Agriculture" into each County.
Resettlement: started to Toro.
Swamp reclamation: Drainage of Kiruruma Swamp.
Fish-farming: a promising start, 40 stocked ponds.
Flax: Kigezi Flax Industry closed down.
Tobacco, flue-cured: expanded in North-Kigezi.
Experimental: Nyakashule Experiment Farm is a striking demonstration of the benefits of efficient agricultural methods.
Rice in Bwindi-Swamp disappointing. Malting Barley = 3,000 lb./acre, Yams (Dioscora spp.), Colocasia (Colocasia antiquorum), Wheat, Tobacco, Barley, Sugar cane.

1956 Five "Field Officers, Agriculture" posted to the Counties.
Enforcement of desirable agricultural practices achieved so far under the guise of "Native Customary Law".
Soil erosion: Stone terraces tried as anti-erosion measures.
Introduction of a farm planning service. Start of an embryo ley farming system in Buhara and Kamwezi sub-counties.
Demonstrations in pest control, purchase of first spraying equipment by some farmers.
Tobacco-flue-cured: 12 tobacco barns erected in North-Kigezi.
Hedging of holdings started, mainly Euphorbia candelabrum and tirucallis.
Experimental: Turkish Tobacco in South-Kigezi, Cotton trials in North-Kigezi (BP 52 + NC 54), fodder crops, grazing trials: Bromus uniloides, Chloris gayana and New Zealand White Clover proved superior in carrying capacity to both natural pasture and natural regeneration.

1957 First County Show in Mpalo.
First accurate map of Kigezi.
Grant of Land Title to individuals endorsed.
Tree planting scheme in Kamwezi, use of Dieldrin against termites.
Coffee: spraying against Antestia, Hemilia, ants and Coccideae.
Potato-sol.: seed problems, variety trials.
Experimental: Cotton, Tea in swamps, fruit trials with budded citrus varieties.

1958 "National Resources Sub-Committee of the District Team" started.
District agricultural policy: consolidation of fragmented holdings, total enclosure with live hedges, followed by grant of title, farm planning or improved layouts, introduction of economic crops.
Hedging: total of 2,216 acres enclosed.
Fish ponds: over 700 ponds stocked.
Ox-cultivation: 2 oxen trained.
Coffee: "Coffee Production Bye-Law" submitted. Forty established nurseries in Kigezi.
Tobacco, flue-cured: first crop = 70,000 lb., "Kigezi Development Company" introduced tractor ploughing on an experimental basis in North-Kigezi for tobacco.

1959 "Crown Land Adjudication Rules, 1958" published and applied in Kigezi.
"Soil and Water Conservation Bye-Law" submitted.
Offences of farmers against introduced cultivation methods noted in "warn books" which are kept in the sub-county headquarters.
Coffee: C.arabica to replace C.robusta in Ruzhumbura.
Tea: tea project planned.
Potato-sol.: new seed from Kenya.

1960 "Kabale Land Titles Office" opened.
Four cattle markets per month in the District: Rukungiri, Mpalo, Kamwezi and Bubale.
District Agricultural Office: 1 District Agricultural Officer, 5 Field Officers, Agriculture, 41 Agricultural Assistants.
Soil Conservation Bye-Law under discussion.
Swamp Reclamation: up to 1961 3,700 acres to be opened.
Coffee: "Coffee Production Bye-Law" passed. Farmers prefer to grow C.robusta after the experiences with Antestia at C.arabica.
Tea: nursery with 400,000 seedlings for Kayonza-Kinkizi area.

1961 Distribution of "Primary Product Buying Permits". Traders who do not submit their turn-over figures lose their permits.

"Kigezi Soil Conservation Bye-Law" and "Kigezi Grass Burning Bye-Law" passed. Soil Conservation Competition discontinued.
3 Co-operative Officers, 1 District Co-operative Officer, 2 Co-operative Assistants posted to Kigezi. The first co-operative in Kigezi, the "Kigezi Growers Co-operative Society" (vegetable) formed, followed by Coffee- and Tobacco Societies.
In all Counties selection of "Progressive Farmers" and "Master Farmers": improvement of their farms through subsidized agricultural tools and implements, improved seed and cultivation methods, agricultural courses and simple planning.
Coffee: pest and disease control team started work in Kigezi.
Tea: ca. 48.5 acres planted.
Experimental: Grams (Phaseolus aureus), Cow pea (Vigna catiang), Cotton, variety tests of beans, potato-sol. and maize.
3 Guernsey cows in Kachwekano.

1962 "Nyarushanje Farm School" and agricultural bias at Kigezi High School opened.
Credit Project for "Progressive Farmers" started.
Ox-cultivation: 10 trained oxen in Kigezi.
Experimental: Black Gram (Phaseolus mungo), Tumerio (Curcuma longa), Ginger (zingiber officinale) fertilizer trials, Sorghum Hybrid and Maize variety trials.

1963 Agricultural Census conducted.
Agricultural Extension Service to be put on a broader base.
"District Farm Institute" planned in Kachwekano.
Group farm planned in North-Kigezi.
Swamp cultivation: Committees founded.
Coffee: Coffee Berry Disease in South Kigezi. Number of nurseries in the District reduced.
Cotton: 28 acres planted in Kihihi.
Groundnut: good harvest in North-Kigezi.
Tea: first picking.
Experimental work concentrates in Kachwekano.

1964 Soil conservation measures intensified in Kigezi.
"Subsidy Scheme" started.
"Tractor Hire Service" introduced in Kihihi cotton growing area.
Castor seed: cash crop in Kinkizi and Ruzhumbura.
Coffee: CBD control measures.
Cotton: Kihihi 233 acres.
Groundnut: demand exceeds supply.
Tea: Kayonza 291 acres.
Nicotine Tobacco: trials to reintroduce this crop.
Vegetable: Block farming introduced in Bubale swamp.
Experimental: Maize, 18 varieties of beans, 30 varieties of wheat, Lemon Grass in North-Kigezi as rotational crop for flue-cured tobacco.

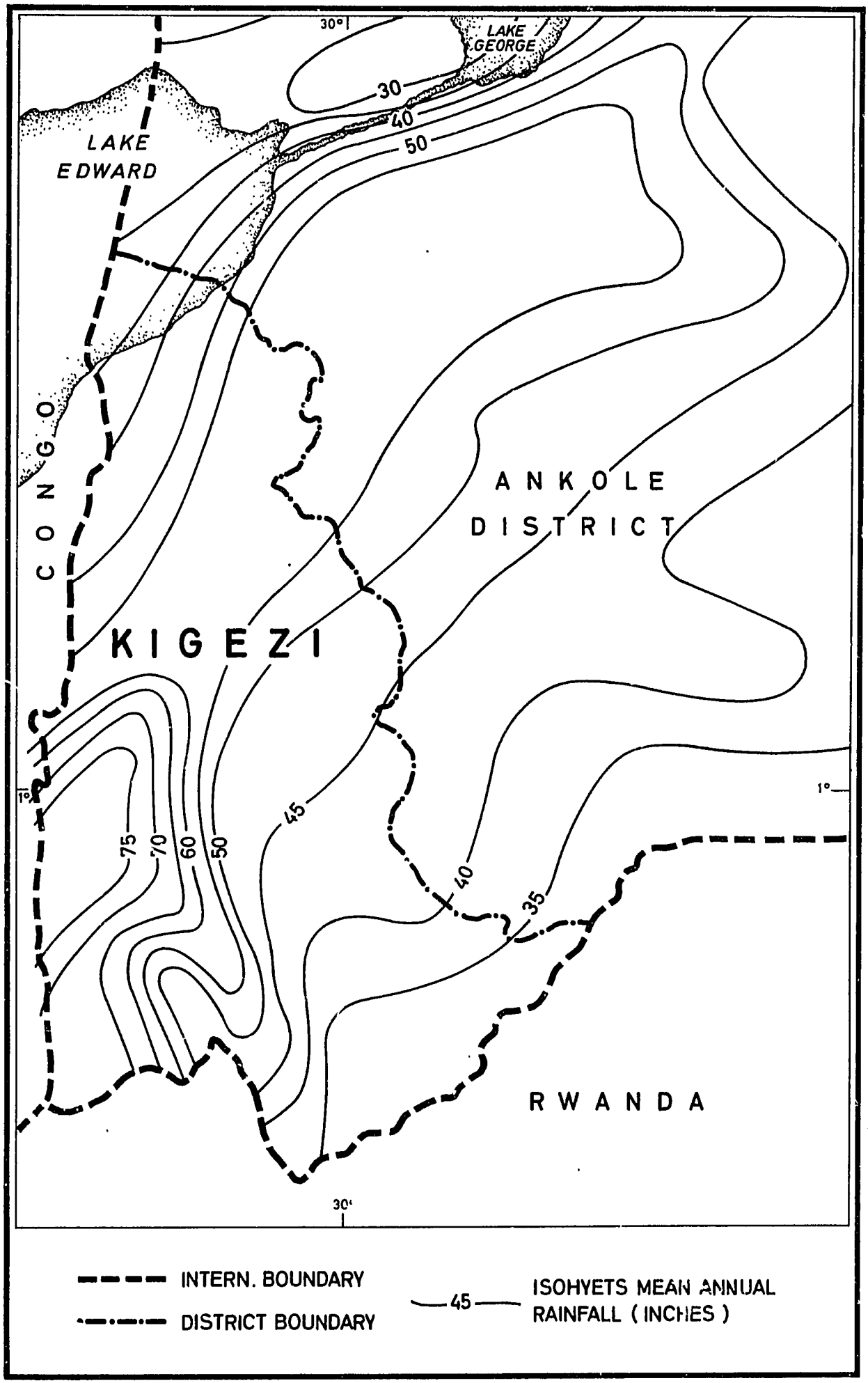
1965 Coffee-Tobacco and Vegetable Co-operative Unions introduced.
"Young Farmers Societies" started.
Extension programme for each County.
Soil conservation often neglected.
"Group Farm" formed with 33 farmers in Kihihi.
Coffee: only well maintained plots are sprayed by the governmental spraying team.
Vegetable: FAO-Expert posted to Kigezi.
Experimental: Guernsey-, Friesian and local cattle in Kachwekano, fertilizer trials, Beans, Maize.
"District Variety Trial Centre" in Kihihi installed: Cotton, Maize, Sorghum and Sunna (Cassia spp.).

1966 "Kachwekano District Farm Institute" opened in January.
"Community Saturation Project" started in Ruzhumbura.
Credits granted only to members of sound co-operatives.
Tractor Hire Serive: 4 tractors working in North-Kigezi.
Experimental: seed multiplication, cattle breeding, vegetable varieties, fertilizer trials, swamp reclamation, pest and disease control in coffee.

1967 "Primary Produce Licenses": 172 distributed.
"Young Farmers Societies": extending, 25 societies with 1,092 members.
Group farming: 55 members.
Tractor Hire Serive: 6 tractors, 881 acres ploughed.
Swamp reclamation: the maintenance now the Local Administration's responsibility.
Cassava: mosaic-resistant variety distributed to farmers.
Coffee: pulperies erected or under construction in Bugangari, Nyakishenyi and Nyarushanje.
Groundnut: virus disease (Rosette desease).
Potato-sol.: production revived and expanded, introduction of "Potato Growing Societies".
Tea: "Uganda Tea Growers Corporation" founded.
Tobacco, flue-cured: production reorganized, "Tobacco Master Growers Scheme" started. "Ihimbo Tobacco Master Growers and Woodfuel Society" formed.
Vegetable: Vegetable Dehydration Plant for Kigezi proposed.
Experimental: Coffee spraying-, variety-, selection- and cultivation trials, variety trials with Maize, Beans, Sorghum. Wheat, Potato-sol., Vegetables, permanent manurial trials ongoing on, cattle rearing and feeding trials.

1968 District Show, best stand: Agricultural Department.
Expansion of Coffee-, Cotton-, Tea-, Tobacco- and Vegetable production.
Young Farmers Societies: 42 Societies with 1,469 members.

Map 3: Mean Annual Rainfall in Southwest Uganda



C. PRE-CONDITIONS FOR VEGETABLE GROWING IN KIGEZI

I. THE CONDITIONS FOR PRODUCTION

1. CLIMATE, SOILS AND VEGETATION

a. CLIMATE

Most parts of Uganda are climatically marked by dry and rainy seasons. The rains succeed the times with the highest temperatures per year and coincide with the movement of the sun North or South of the Equator. Besides, there are connections between these dry and rainy periods and the main currents of air both on the surface and in the upper atmosphere. The currents on the surface are commonly known as Southeast- or Northeast Monsoons. These winds tend to move with the sun. Uganda, particularly the Western Districts, also receive rains carried by currents from the West originating from the Congo basin.

According to the rainfall Uganda can be divided into five zones[1]:

Table 9. Rainfall Zones in Uganda

Zone	Area
Zone I	1270-2160 mm (50-85 in.): Lake Victoria, a strip 30-50 miles wide along the shores.
Zone II	510-1015 mm (20-40 in.): Karamoja.
Zone III	West Uganda. This zone may be subdivided into: - 1015-1400 mm (40-55 in.): West Nile - 1145-1650 mm (45-65 in.): Toro-Bubyoro - 890-1015 mm (35-40 in.): L.Albert, L.Georg, Northeast of L.Edward - 1270-1905 mm (50-75 in.): South Western Hill sub-zone.
Zone IV	1270 mm (50 in.): Acholi-Kyoga.
Zone V	1015 mm (40 in.): Ankole-Buganda.

Source: UG.GOV.: Uganda Atlas, loc.cit., p.14.

1) UG.GOV.: Uganda Atlas, loc.cit., p.14.

The Uganda Atlas describes the Western Zone as follows: it "... might fairly be described as a transition zone between the Congo forest and Uganda savanna climates. Rainfall is by no means an entirely afternoon phenomenon, but may occur at any time of the day...". Compared with the rest of the Western Uganda Zone the South-Western Hill Zone receives lighter, more protracted rains, frequently in connection with mists. This type of rainfall is probably one of the reasons why soil erosion is not as severe as in other parts of Uganda. From December till February the entire Western Zone experiences a dry season. The Southwest of this Zone encounters an additional marked dry period between June and August[1].

The following data are based on the observations of the Kabale Meteorological station. It has to be noted that these figures cannot cover the conditions of all essential places in South East Kigezi[2].

Table 10. Rainfall, Temperature, Relative Humidity and Sunshine at Kabale Station

Month	Rainfall a)		Temperature b)		Rel.Humidity		Sunshine
	Mean rainfall	Mean No.of days c)	Mean Max. Temp.	Mean Min. Temp.	Mean R.H.at 08.30	Mean R.H.at 15.30	Mean hours per day
January	62.4	6	23.7	9.8	85	57	4.8
February	90.4	8	23.8	10.1	95	58	5.6
March	113.0	14	23.5	10.4	96	62	5.0
April	137.6	17	22.7	11.2	97	68	4.3
May	92.7	8	22.3	11.5	96	68	3.7
June	26.7	1	22.6	9.3	95	60	5.7
July	20.2	-	23.1	8.6	97	52	5.5
August	54.3	4	23.4	9.8	92	51	4.8
September	95.1	10	23.7	10.2	93	57	5.2
October	97.1	16	23.4	10.4	94	61	5.1
November	108.9	16	22.9	10.4	95	65	4.5
December	92.6	13	23.1	10.3	96	63	4.4
Year	991.0	115	23.2	10.1	95	60	4.9

a) in millimetres
b) a "Rain Day" is a day on which 1.0 mm or more is recorded
c) in Centigrade

Source: UG.GOV.: Stat.Abstr. 1966, loc.cit., p.2-4.

1) UG.GOV.: Uganda Atlas, loc.cit., p.14.

2) P.A. HUXLEY: Climate and Agricultural Production in Uganda. Reprint Series No.26.Epl.Agric., 1,81-97. Faculty of Agriculture Makerere University College, 1965, p.84.

b. **SOILS**

"... The underlying rocks of the Western Province are mainly sedimentary rocks of pre-Cambrian age, their metamorphosed products and later intrusions such as schists, gneisses, granites, etc. which underlie the sedimentaries...". The shales and phyllites of Kigezi are grouped in the Karagwe Ankolean system[1].

Within the area of the Vegetable Scheme the main types of soils are[2]:

- Kabale Catena
- Bugangari Series
- Papyrus Peat.

Kabale Catena[3]

Lying on Ankole Surface and its remnants the soils of the Kabale Catena are the most widespread and intensively cultivated in Kigezi. Changes in parent rock, e.g. outcropping bands of quartzite cause much local variation. The composition of the phyllites themselves does not seem to vary greatly. HARROP writes: "... Being products of a previous weathering cycle they are not likely to yield on weathering the amounts of variety of nutrients that a fresh crystalline rock would. Many of these phyllite soils probably owe their productivity to the more retentive nature of their clay fractions and to rooting depth, for even on some of the the steeper slopes, 10-20 degrees, the soils are remarkably deep...".

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1) UG.GOV.: J.F. HARROP: The Soils of the Western Province of Uganda. Kampala 1960, p.3.

2) See table 11.

3) UG.GOV.: J.F. HARROP: loc.cit., p.30. G.MILNE: A Provisional Soil Map of East Africa with Explanatory Memoir. London 1936, p. 16. H.L. LUDWIG: Ukara - Ein Sonderfall tropischer Bodennutzung im Raum des Victoria-Sees. München 1967, p.61.

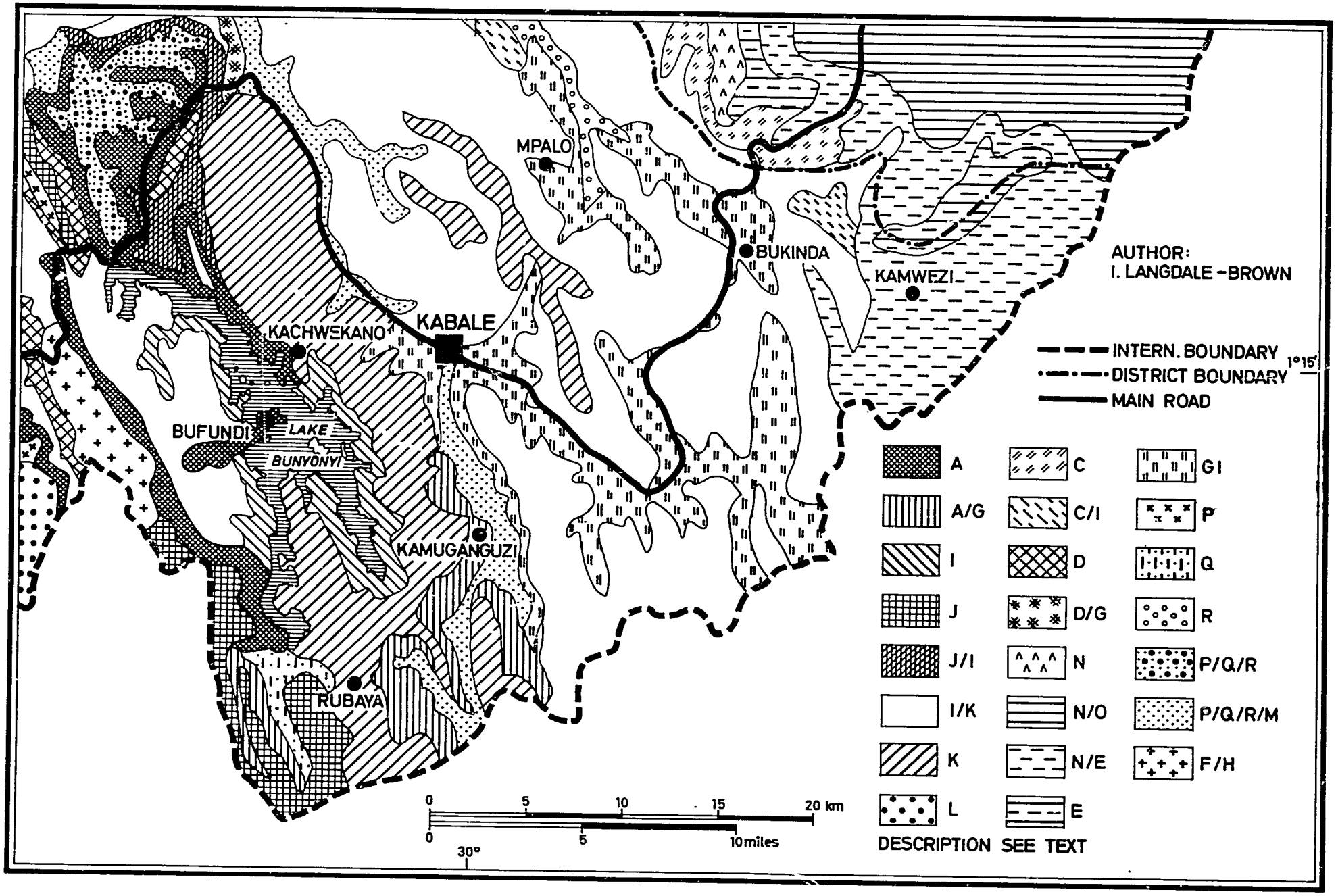
Table 11. Soils in Kigezi

Soil Group	Locality	Dominant Soil Types	Parent Rock	Productivity
Soils derived from volcanic rocks	SW-Kigezi	Black humose loams	Bufumbira lava	nil to moderate
	SW-Kigezi	Humose brown loams	Ash and lava	moderate to high
	N-Kigezi	Black sandy clay loams and clay loams	Pleistocene volcanic tuff and ash	high
Soils derived from volc.and pre-cambrian rocks	S-Kigezi	Brown loams/clay loams	Pumice ash/phyllite	moderate to high
Soils derived from pre-cambrian rocks	Rukiga-Highlands	Dark horizon latosols, loams	Karagwe-Ankolean phyllite	low
	S-Kigezi	Dark horizon latosols, sandy loams	Karagwe-Ankolean sandstones, quartzites and granite	low to medium
	S-Kigezi[a]	Red and reddish-brown clay loams locally lateritized	Karagwe-Ankolean phyllite	medium to high
	W-Kigezi	Clay loams and silt clay loams	Karagwe-Ankolean phyllite	low
	SE-Kigezi	Red clay loams	Laterite residues(?)	medium to high
	Kigezi	Red clay loam, nonlateritized	Schists, amphibolites	medium to high
	Cent.Kigezi	Reddish-brown quartz clay loams	Granites, gneisses	low to medium
	Kigezi[b]	Shallow black sandy loams	Granites, gneisses	low to medium
Soils derived from Rift Valley Sediments	Kigezi	Black clay loams	Calc-sinter(tufa)	moderate to high
	NW-Kigezi	Deep,reddish-brown sands	Kaiso beds	low
	NW-Kigezi	Deep brown sands,occasionally gravelly	Kaiso beds	low to medium
	N-Kigezi	Sandy loams and sandy clay loams	Rift Valley sediments	low
Alluvial soils	Kigezi c)	Peaty clays	Papyrus peat	medium high

a) Kabale Catena
b) Bugangari Series
c) Papyrus Peat

Source: J.F. HARROP: loc.cit., p.12 ff.

Map 4: The Types of Vegetation in South-East Kigezi



The clay loam texture promotes a firmer and more stable soil structure. Thus the soils have not been subject to any man-accelerated erosion in the past. HARROP states that "... soil development has kept pace with the normal geological process of slope retreat."

The "Bugangari Series"[1)]

These are soils in areas affected by Rift Valley faulting. HARROP: "... The soils, therefore, are of relatively recent origin and are in many cases almost sceletal, their depth depending to a large extent on the present vegetation and land use."

The Papyrus Peat[2)]

Because of population pressure and in the search for a production independent of dry periods the cultivation of the papyrus swamp areas in Kigezi was started. Detailed research on these peats was carried out in 1952/53[3)]. After draining these underwater soils build up acids, which are caused by sodium sulphates in the G-profile or in the neighbouring hills resulting in precipitation by evaporation of the solvent. In practice it means that peats with an average pH of 5 to 6.5 before drainage fall back to an average pH of 3 to 4, in spite of the preventative measure of keeping the water level as high as possible.

Sweet potato is the crop commonly grown under those conditions by the farmers in Kigezi. According to the intensity of cultivation several years (5 to 10 years) are needed for the natural transformation process into a Gyttja-like soil[4)], which allows crops like beans, maize, sorghum, potato or vegetable (pH 5-6) to grow.

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1) UG.GOV.: J.F. HARROP: loc.cit., p.52.

2) UG.GOV.: A. GIBBS and Partner: Water Resources Survey of Uganda, 1954-1955. 1955, p.19.

3) UG.GOV.: J.F. HARROP: loc.cit., p.70, UG.GOV.: E.M. CHENERY: A Study of the Chemistry of Dead Swamps in Kigezi District, South West Uganda. 1953. F. SCHEFFER-P.SCHACHTSCHABEL: Lehrbuch der Agrikulturchemie und Bodenkunde, Teil I Bodenkunde. Stuttgart 1956. p.217.

4) F. SCHEFFER-P.SCHACHTSCHABEL: loc.cit., p. 218.

c. VEGETATION

Within the area of the Kigezi Vegetable Scheme the montane thicket climax and the herb swamp climax are dominant, as shown in map 4.

Discription to Map 4:[1)]

- Communities related to the moist semi-deciduous forest climax:
  (A) Hyparrhenia cymbaria-Pteridium aquilinum-deciduous trees seral tree savanna
  (B) Miscanthidium violaceum seral aquatic grassland.
- Communities related to the semi-evergreen thicket climax type
  (C) Acacia spp.-Albizia spp.-Beckeropsis uniseta-Cymbopogon afronardus fire climax tree savanna
  (D) Cymbopogon excavatus-Pteridium aquilinum-Melinis spp. seral tree savanna (possibly related to a forest climax).
- Communities related to the deciduous thicket climax type:
  (E) Acacia gerrardii-Cymbopogon afronardus seral tree savanna.
- Communities related to the bamboo montane forest climax type:
  (F) Bamboo montane forest (climax).
- Communities related to the moist montane forest climax type:
  (G) Pennisetum clandestinum "disturbance" climax montane grassland
  (H) Undifferentiated moist montane forest (climax).
- Communities related to the montane thicket climax type:
  (I) Montane thicket (climax)
  (J) Pteridium aquilinum-Melinis spp.-Loudetia kagerensis fire climax grassland
  (K) Exotheca abyssinica-Hyparrhenia spp. fire climax grassland
  (L) Exotheca abyssinica-various tree "disturbance" climax.
- Communities related to the montane swamp forest climax type:
  (M) Syzigium cordatum climax swamp forest.
- Communities related to the grass savanna climax type:
  (N) Themeda triandra-Chloris gayana fire climax grass savanna
  (O) Themeda triandra-Loudetia kagerensis fire climax grass savanna.
- Communities related to the herb swamp climax type:
  (P) Cyperus papyrus natural or fire climax herb swamp
  (Q) Cyperus latifolius climax herb swamp.

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1) UG.GOV.: I. LANGDALE-BROWN: The Vegetation of the Western Province of Uganda, loc.cit.

2. ECONOMIC PRE-CONDITIONS

a. CONDITIONS OF LAND TENURE

In Kigezi land is owned or cultivated by African farmers only[1]. In the following, African farm holdings within the vegetable growing area in South-East Kigezi are being discussed[2]:

- parts of Ndorwa County
- parts of Rukiga County
- parts of Rubanda County.

South-East Kigezi is characterized by its mountainous landscape and its valleys mostly covered by large swamps. The terraced hills are often cultivated up to the tops. Negotiability of land, the nature of the terrain, and mainly the present system of inheritanc of land are factors which contribute to subdivision and fragmentation, which are marking features of South-Kigezi[3].

The comparison of the population with the number of holders and individuals living in holders' households in Kigezi indicates the extent of agricultural enterprise.

Table 12. Comparison of the Population with Holders and Individuals in Holders' Households 1963

Total Population 1963[a]	Holders 1963	Members of Holders' Households 1963
655,322	85,671	534,162

a) estimated

Source: UG.GOV.: Report on Ug.Cens.of Agr., Vol.I, loc.cit., p.22. UG.GOV.: District Files Kigezi.

1) H. INGRAMS: loc.cit., p.233.

2) See map 5.

3) H.D. LUDWIG: loc.cit., p.168. B.K. TAYLOR: East Central Africa, Part XIII, The Western Lacustrine Bantu. London 1962, p.120. UG.GOV.: Land Tenure in Uganda. Entebbe 1957, p.17.

In 1936 land in Kigezi was so called "Crown Land". Nobody could be deprived of his right of land ownership unless he left the area or did not cultivate the particular piece of land for a long period[1]. Under the present system of "Land Tenure" holders can be divided, according to the Report on Uganda Census of Agriculture, into two major groups[2];

- The holder possesses a title of ownership, and therefore has the right to dispose of the land if he wishes.

- The holder although not possessing a legal title to the land, farms it in an ownerlike way including land under long-term or perpetual leases; land operated under tribal or traditional customs; land which has been operated by the holder for many years without payment of rent; land the holder has received from communal land which he keeps as long as he continues to cultivate it.

In 1958 the ROYAL COMMISSION ON EAST AFRICA recommended that security of ownership over land was highly desirable to allow a farming community to emerge from the subsistence peasant cultivation[3]. In July 1958, according to the legislation, adjudication of boundaries and survey for title was commenced in a pilot area in Ruzhumbura County. Gradually the farmers realized the advantages of obtaining a title for their holding so that in 1963 the Agricultural Officer reports about a "tremendous increase" in applications for land titles[4]. In areas of acute fragmentation the farmers were advised about consolidation before the boundaries were adjudicated. At present, farmers within the Ruzhumbura pilot area, people around Kabale and several mission stations hold "Land Titles".

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1) UG.GOV.: District Files, Kigezi. M.M. EDEL: loc.cit., p.99.

2) UG.GOV.: Rep.on Ug.Cens.of Agr., Vol.I, loc.cit., p.37. From March 1969 on one should refer to the PUBLIC LAND BILL.

3) UG.GOV.: District Files, Kigezi.

4) UG.GOV.: District Files, Kigezi.

Applications for surveying of land and granting of land titles are being considered only if within a Muluka at least 70 to 80 interested persons have paid the deposit of sh. 110 and if the area is not too much fragmented. The legal situation of land owners without land titles has been experienced during the negotiations for the land needed for the new section of the Kabale-Ntungamo (Ankole) Highway: Only perennial crops such as bananas, coffee trees, etc. and the value of buildings have been paid for.

Holdings subject to a land title are continuously encountering the problem of being divided according to customary law after the death of the owner, the heirs forgetting to get their title registered again. Thus these rights expire anulling the value and effect of land titles.

The traditional system of land ownership follows three main principles[1]:

- Land is bought and sold. Any Uganda citizen can buy land provided that the family of the seller agrees to it. Members of the family, relatives or neighbours usually have first choice to buy. The price for an average plot in South-Kigezi varies from 300 to 500 sh. along the hillsides to 600 to 800 sh. in the valleys and along swamps and rivers[2].

- Land is lent. The share of rented land is relatively low. However, owners who leave give their land to their relatives for using or let it fallow.

- Land is inherited. BYAGAGAIRE states: "Although the negotiability of land and the nature of the terrain in Kigezi are factors which

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1) J.M. BYAGAGAIRE: A Summary of Agr. in Kigezi, loc.cit., p.17.

2) The author's investigation. An average plot in South-Kigezi: ca. 0.073 ha. (0.18 acres).

contribute to sub-division and fragmentation, it is the present system of inheritance of land which is mainly responsible for both processes."[1)]

Questions concerning land and land development will be dealt with by the "Public Land Bill", passed by Parliament in March 1969.

b. FARM STRUCTURE

Farm Size

In most parts of South-Kigezi the population pressure on the land is seriously high. Together with Bugisu, Kigezi has the highest population density in Uganda[2)].

In 1946 the Government of Uganda started a Resettlement Scheme moving farmers from South-Kigezi into unpopulated former sleeping sickness and malaria areas of Kinkizi and Ruzhumbura County in North-Kigezi and to Ankole and Toro. The settlers were granted tax exemption for two years and were provided with free transport and foodstuffs until they had grown their own products. The Government established a regular health service, built roads and erected temporary shelters in some cases.

The project continued until 1962. Within this period 44,533 persons were resettled under Government assistance[3)]. The number of those who moved from South-Kigezi without aid is estimated at 25,000[4)]. This action provided a certain relief of the population pressure in parts of South-Kigezi but cannot be regarded as a solution to the problem of continuous population increase in this area.

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1) UG.GOV.: Fragmentation of Agricultural Land in Uganda. Entebbe 1961. UG.GOV.: Land Tenure in Uganda, loc.cit., p.17 ff.

2) See table 1.

3) UG.GOV.: District Files, Kigezi. D.G.R. BELSHAW: An Outline of Resettlement Policy in Uganda 1945-1963, in Nkanga Editions No. 3, loc.cit., p.20.

4) UG.GOV.: District Files, Kigezi.

According to WICKHAM[1] a family in South-Kigezi cultivated an average of 12 acres annually in 1925. In 1934 this figure had already decreased to 7 acres. WICKHAM proposed to cultivate the vast swamp areas[2]. PURSEGLOVE, one of the initiators of the Resettlement Scheme and the anti-erosion measures in Kigezi, found during his investigations in 1945 that the average area used for food production was 4.97 acres per family. A family had an average of 5.89 heads, i.e. 0.84 acres per head[3].

The REPORT ON UGANDA CENSUS OF AGRICULTURE gives the following data:

Table 13. Land Availability

District	Total Land Area in sq.miles a) (I)	Corrected Area of Holdings in sq.miles (II)	(II) as % of (I)
Uganda b)	60,764	14,842	24.4
Kigezi	1,902	800	42.1
Bukedi	1,575	1,169	74.2

a) Total land area: includes sleeping sickness areas, forest reserves, national parks and game sanctuaries, land within boundaries of townships and land that is unsuitable for cultivation.

b) Excluding Toro and Karamoja.

Source: UG.GOV.: Rep.on Ug.Cens.of Agr., loc.cit., Vol.III, p.17.

Comparing the area of holdings as per cent of the total land area, Kigezi takes the fourth place within Uganda after Bukedi, Busoga and Bugisu (all Eastern Region). The average area of holdings in Uganda differs between 20.57 acres in Teso and 5.07 acres in West Nile. Kigezi with an average area of holdings of 5.98 acres, comes in front of West Nile[4].

1) - 3) UG.GOV.: District Files, Kigezi.

4) UG.GOV.: Rep.on Ug.Cens.of Agr., loc.cit., Vol.III, p.14 ff.

The figures above indicate that the mean size is influenced by a number of large holdings, situated in North-Kigezi. Moreover, it has to be pointed out that the size of the holdings in the vegetable growing areas of South-Kigezi, in Ndorwa-, Rukiga-, and Rubanda-County as well as in Bufumbira County is much lower than the average of Kigezi.

Table 14. Area under Cultivation 1963/64

	Number of Holders	Cultivated Area 1963/64 acres	Average Area per Holding under Cultivation acres	Average Area of Holdings acres
Uganda[a)]	170,921	5,589,000	4.77	9.75
Kigezi	85,671	387,000	4.51	5,98

a) Excluding Toro and Karamoja.

Source: UG.GOV.: Rep.on Ug.Cens.of Agr., loc.cit., Vol.III, p.22.

In Kigezi the holdings under 1.24 acres averaged four plots per holding thus the average size of a plot for these smaller holdings would only measure 0.3 acres. This average size of holding is characteristic of the vegetable growing area.

Table 15. Size Distribution of Holdings and Average Number of Plots of Land by Size of Holding

Size of Holding in acres	Size Distribution of Holdings in %		Average Number of Plots of Land	
	Uganda	Kigezi	Uganda	Kigezi
0.00- 1.24	10.1	17.4	1.8	4.0
1.24- 2.48	10.6	16.3	1.9	6.3
2.48- 4.96	25.3	24.4	1.9	8.0
4.96- 7.44	16.4	14.0	1.9	5.5
7.44- 9.92	9.9	5.8	2.0	4.8
9.92-12.40	8.2	5.8	2.1	4.0
12.40-24.80	11.2	9.3	2.1	4.2
24.80 +	8.3	7.0	1.8	2.0
All Holdings	100.0	100.0	2.0	6.2

Source: UG.GOV.: Rep.on Ug.Cens.of Agr., loc.cit., Vol.III, p.19 and 29. Figures for Uganda exclude Toro and Karamoja.

Half of the holdings in Kigezi had four or more plots and only approximately one third, mainly in Ruzhumbura and Kinkizi, were consolidated. An urgent need for consolidation in South-Kigezi actually exists providing a difficult task for the Department of Land and Surveys and Agriculture.

The land availability differs greatly within Kigezi. In 1960 24 per cent of the population of Kigezi were living in an area of 208 sq.miles around Kabale, which makes only eleven per cent of the total land area of Kigezi[1]. The vegetable growing sub-counties cover roughly this zone[2].

Farm Assets

The capital investment in Kigezi consists mainly of live capital = stock. The traditional stock ownership constitutes wealth (brideprice)[3]. Animal husbandry plays a considerable part in life and in income of the population, mainly in North-Kigezi, in former times providing meat, milk, and clothing; nowadays meat, milk, and to some extent manure.

Table 16. Number of Livestock in Kigezi Counties, 1965

County	Cattle	Sheep	Goats	Pigs
Ndorwa	14,530	6,752	14,246	70
Rukiga	22,794	12,267	24,387	36
Ruzhumbura	23,388	7,816	25,266	6
Bufumbira	12,518	8,812	20,372	120
Rubanda	13,449	10,702	16,856	66
Kinkizi	3,623	4,601	15,963	60
Total	90,302	50,950	117,090	358

Source: UG GOV.: District Files, Kigezi.

1) UG.GOV.: District Files, Kigezi

2) See map 5 and table 3 and 4.

3) B.K. TAYLOR: loc.cit., p.122. M.M. EDEL: loc.cit., p.104 ff. E.R. YELD: Continuity and Change in Kiga Patterns of Marriage. U.E.A. Social Science Conference, 1966, p.2 ff.

In Kigezi 24.9 per cent of the holdings claim to have a share of communal grazing. 75.1 per cent have to follow the traditional herding in the fields in fallow[1]. Making use of the grounds left fallow in this way lowers on one hand the effect of natural regeneration and on the other hand makes the efforts of the Department of Agriculture to introduce temporary leys of grass and legumes nearly impossible.

The dead capital comprises houses, granaries and farm implements. An average house costs:

- with thatched roof: 150 - 200 sh.
- with corrugated iron roof: 600 - 1,000 sh.

A family needs as a rule 2 to 3 granaries for storing sorghum and maize. Beans, peas and finger millet are kept in containers inside the house. It is interesting that in former times the Bakiga stored food in cellars. This was to protect the property from the raids of the Batwas carefully concealed under the house or in the kraal[2].

The tool for cultivating and digging is the hoe. Although in 1925 a District Officer had already tried to introduce oxploughs the KIGEZI DISTRICT ANNUAL REPORT of the Agricultural Department for 1968 comments: "It appears that farmers are very slow in taking up the idea of using oxen to work..."[3]. In North-Kigezi the Tractor Hire Service introduced tractors mainly in the Group Farm and tobacco and cotton growing area[4]. In South-Kigezi with its hilly, heavily fragmented and overpopulated character hoe culti-

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1) UG.GOV.: Rep.on Ug.Cens.of Agr., loc.cit., Vol.I, p.73, M.M. EDEL: loc.cit., p.103.

2) UG.GOV.: District Files, Kigezi.

3) UG.GOV.: Kigezi District Annual Report 1968, Department of Agriculture, p.15.

4) In 1968 495.1 ha. (1,223.5 acres) were mechanically cultivated in Kigezi.

vation is the only method being used. In stony soils the hoe is replaced by the forked hoe. Further tools are: the local sickle (omuhoro), the sickle, the axe, the panga, the knife. The average value of the tools per holding lies between 30 and 50 sh.

The Labour Economy

The holdings in Kigezi are family smallholdings. The average family consists of 6.2 members[1]. The median family size is 5.3[2]. PURSEGLOVE counted in 1945 5.89 heads per average family in South-Kigezi[3].

Table 17. Individuals in Holders' Households by Age and Sex in Uganda and Kigezi

Age-Group	Sex	Uganda a) Number	%	Kigezi Number	%
Under 16	M	1,403,268	45.3	140,163	53.9
	F	1,310,556	43.2	133,456	48.7
16 - 45	M	1,206,682	38.9	88,968	34.2
	F	1,358,281	44.8	114,581	41.8
Over 45	M	488,483	15.8	30,956	11.9
	F	362,286	12.0	26,038	9.5
Total	M	3,098,433	100.0	260,087	100.0
Total	F	3,031,123	100.0	274,075	100.0

a) Excluding Toro and Karamoja.

Source: UG.GOV.: Rep.on Ug.Cens.of Agr., loc.cit., Vol.I., p.43 and 44.

According to the Report on Uganda Census of Agriculture "... the apparent "deficit" of girls under the age of 16 years when compared to the number of males under 16 years of age is a common phenomenon of age statistics in East Africa...", being partly caused

1) UG.GOV.: Rep.on Ug.Cens.of Agr., loc.cit., Vol.I., p.42. Uganda excluding Toro and Karamoja = 5.2.

2) Uganda excluding Toro and Karamoja = 4.1.

3) UG.GOV.: District Files, Kigezi.

by enumerating errors[1]. In spite of these errors inflating the figure for females "16 to 45 years" the deficit of males between 16 and 45 years is marked, indicating the high rate of young men leaving Kigezi for other parts of Uganda (Kilembe Mines, Buganda etc.).

Table 18. Individuals by Age, Sex and Work in Holding in Kigezi

Work on Holding	Age Group	Sex	Kigezi	%
Full-time	under 16	M	13,357	2.5
		F	18,897	3.6
	16 - 45	M	55,154	10.3
		F	90,772	17.0
	over 45	M	19,508	3.7
		F	13,276	2.5
Part-time	under 16	M	61,600	11.5
		F	53,790	10.1
	16 - 45	M	30,203	5.7
		F	21,977	4.1
	over 45	M	8,553	1.6
		F	7,734	1.4
None	under 16	M	65,206	12.2
		F	60,769	11.4
	16 - 45	M	3,611	0.7
		F	1,832	0.3
	over 45	M	2,895	0.5
		F	5,028	0.9
Total			534,162	100.0

Source: UG.GOV.: Rep.on Ug.Cens.of Agr., loc.cit., Vol.I., p.49.

The farmers in Kigezi start field work between 7 and 9 a.m. Frequently occurring mists delay the start of the farmers' activities. Lunch is taken in the fields. At about 3 to 5 p.m. people return home. Daily field work averages 6 to 10 hours.

1) UG.GOV.: Rep.on Ug.Cens.of Agr., loc.cit., Vol.I, p.43

Formerly men only helped clearing the bush. Digging, sowing, weeding, and harvesting were the women's responsibilities. They only received assistance by men when transporting the crops. This pattern has changed considerably. Men can be found engaged in all types of fieldwork but concentrating their interest mainly on cash crops. Cultivating is carried out by all members of the family. The youths prefer digging in groups helping each other in turn. Even children of 5 to 6 years can be seen using the hoe energetically. Hired labour is mainly used for digging before pea-sowing time (March - April) and before sorghum sowing (December - January). The wage rates are between sh. 1.50 and 2.50 per day, including food[1]. In 1936 the payment consisted of: a day's food for a day's work or one pot of beer for six men's work[2].

Table 19. Employment of Labour by Size of Holding in Kigezi

	Holders who employed Labour in %		
	Holding 0-5 acres	Holding 5-10 acres	Holding over 10 acres
Uganda	27.3	40.7	51.1
Kigezi	8.7	14.5	24.8

Source: UG.GOV.: Rep.on Ug.Cens.of Agr., loc.cit., Vol.III., p.36.

c. LAND USE

Pre-Conditions for Production

The fields can be classified into three groups:

- Most of the arable land stretches along and over the hills, slopes up to 45 degrees being cultivated.
- A lower percentage of arable land covers areas along the edges of swamps, rivers and lakes, being fairly level. These soils represent the highest productivity.

1) The Government's wage rate = sh. 5.40 per day.

2) UG.GOV.: District Files, Kigezi.

- The third group are the parts of swamps which can be cultivated.

Already in 1919 ROSCOE describes in detail the cultivation methods of the Bakiga[1]; "... their fields extend up to the slopes of the mountains and marked off from each other by ridges where the weeds and stones are gathered together. After a few seasons the fields become regular plateaux, for the rains wash the earth from the higher ground against these ridges and form terraces raised above the lower fields. As I wandered along a path on the side of a mountain and looked over to the opposite side of the valley the fields looked as though they were laid out in terraces and fenced...".

Intensive measures to reduce soil erosion were undertaken by the first District Agricultural Officer of Kigezi in 1934. Until 1937 first planting was done along contour lines under governmental supervision. In 1938 the first African "Agricultural Assistants" and "Instructors" advised farmers about planting strips of Elephant Grass (Pennisetum purpureum) and Erythrina (Erythrina abyssinica) etc. across the slope at the bottom or in the middle of their plots. The same applied to the cultivation of sweet potatoes on ridges along contour lines.

Plots for flax growing being subject to high soil erosion, their standard size was laid down in 1942 as to 38 yd. in length and 16 yd. in width of terrace, which corresponds with half an acre. Each plot was separated from that above or below by an uncultivated grass strip of 4 - 5 ft., with Elephant Grass planted on the upper side of the grass strip.

The average plot size is quoted in 1945 as 0.174 acres. In 1946 together with the Resettlement Scheme intensive antierosion measures were started. Terraces were aligned following the con-

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1) J. ROSCOE: loc.cit., p.101.

tour lines on to continuous strips, described as "... a vast improvement on the old "patch work"..." the width of the strip (= terrace) being 16 yd., which was reduced to 12 yd. on the steeper slopes. Elephant Grass planting on the upper side of the grass strip continued.

The District Commissioner of Kigezi stated in 1948 that the anti-erosion measures being universally accepted under "Local Law and Order", were obligatory. In connection with these measures the District Officers in charge created a "Soil Conservation Competition" on sub-County level in 1945. Prizes worth sh. 2,500-3,000 were distributed among the three winning sub-Counties whereby the Chief and the Agricultural Officer in charge were presented with an award of sh. 10 - 20 each. The prizes given to the winners were mostly used for conducting "Soil Conservation Feasts".

All these efforts resulted at least in the "District Soil Conservation Bye-Law" and "Grass Burning Bye-Law" which were passed by the District Council in 1961. By then the Soil Conservation Competition was discontinued and the new bye-law took its place. These bye-laws are at present more generously interpreted. Lack of maintenance and undermining cause the breaking down of the terraces. The more fertile soil, gathered over the years along the strips considerably improves the productivity of the fields below the collapsed terraces, a fact the farmers are aware of and which creates a big temptation to favour the process of neglected maintenance of the terraces.

The terraces show a marked decrease in plant growth towards the hillside. This has been named by the author as "terrace effect". Sorghum in particular demonstrates these signs of productivity decrease towards the hillside. It is obvious that the problem of terrace effect has to be solved as soon as possible without increasing the danger of soil erosion:

- The officers in charge should enforce the rules contained in the Soil Conservation Bye-Law more strictly and effectively.

- In cases of the breaking down of the terraces, which the author would not support, immediate action must be taken against soil erosion by erecting new ridges and planting grass strips.

- The terraces which are now mostly horizontal could easily be cultivated towards the hillside, thus providing again a cover of top soil over the bare subsoil on the part of the terrace against the hill.

- Using mineral fertilizers only might not be an optimal solution; in any case it has to be noted that the average farmer in South-Kigezi will not be able to afford to buy fertilizers for some time to come.

The following bye-laws assist the agricultural staff in Kigezi District:

- Kigezi Coffee Production Bye-Law (1958)
- Kigezi Soil and Water Conservation Bye-Law (1959)
- Kigezi Grass Burning Bye-Law (1961)
- Kigezi Soil Conservation Bye-Law (1961).

Fragmentation in South Kigezi has reached a stage where the utilization and efficiency of labour are considerably reduced. This means that the introduction of proper rotation systems is impossible, mechanisation is often impracticable and modern dairy farming is being retarded. In short, productivity cannot be fully exploited.

These holdings will never be able to compete with consolidated farms. Much time and effort is spent reaching the far distant plots, often overcoming remarkable differences in altitude. This factor has a negative influence on the profitability of hired labour as well. Farmers tend not to grow crops in the fields far

from their homes which might be subject to theft. Transport, the number of weedings needed or possible bird attacks are other points causing selective crop production on land nearer or farther from the homes, generally resulting in over-cropping of the nearest strips. Mechanisation and use of modern agricultural implements cannot be conducted efficiently and economically as the fields are too scattered and their average size is not big enough. In addition, the present road system, the wide swamp areas, which would have to be crossed and the steep slopes would not allow any mechanization in South Kigezi for the moment.

Integration of dairy cattle into a mixed farming system is in most cases limited. As transport of manure and dung to plots miles away is very difficult an improvement in soil fertility cannot be achieved on a big scale. Modern dairy farm management with fenced pastures, adequate breeding, feeding, spraying etc. has been started by progressive holders. The majority of the Kigezi farmers however lack the necessary land areas.

Table 20. Crop Statistics 1950 for Kigezi District

Crop	Number of Plots	Mean Plot Size in acres	Total Acreage in acres
Beans mixed	372,556	0.105	39,118
Beans soya	181	0.05	9
Coffee arabica	555	0.09	210
Coffee robusta	420	0.34	200
Flax	2,331	0.14	233
Groundnuts	32,817	0.15	4,923
Maize	207,708	0.09	18,694
Sorghum	222,600	0.64	142,464
Fingermillet	176,978	0.26	46,014
Onions	4,537	0.025	123
Peas field	208,916	0.15	31,337
Plantains	39,801	0.22	32,416
Sweet Potatoes	691,684	0.11	76,085
Potato, sol.	147,012	0.05	7,350
Tobacco, air-cured	389	0.14	56
Tobacco, nicotine	19,932	0.096	1,917
Wheat	5,967	0.09	537
Cassava	40,227	0.05	2,011
Sunflower	8,282	0.05	414
Simsim	6,106	0.01	61
Misc. crops	18,247	0.02	365
Total	2,207,246	0.18	404,337

Source: UG.GOV.: District Files, Kigezi

Table 21. Acreage and Number of Plots in Pure and Mixed Stand of the Main Crops in Kigezi

Crop	Acreage Pure	Acreage Mixed	Acreage Total	DAO Report 1968 a)	Number of Plots Pure	Mixed	Total	% of Holder Growing
Plantain	26,000	2,000	28,000	19,199	63,000	8,000	71,000	65.6
Sorghum	116,000	3,000	119,000	112,601	421,000	9,000	430,000	77.1
Finger Millet	24,000	2,000	26,000	29,079	103,000	6,000	109,000	44.7
Maize	18,000	17,000	35,000	68,334	91,000	82,000	173,000	80.5
Wheat	-	-	-	3,725	-	-	-	-
Bean	61,000	28,000	89,000	133,266	290,000	122,000	412,000	96.3
Pea	39,000	1,000	40,000	51,253	156,000	2,000	158,000	52.5
Groundnut	-	-	-	6,076	-	-	-	-
Sweet Potato	57,000	500	57,000	243,519	327,000	2,000	329,000	93.3
Potato sol.	-	-	-	20,936	-	-	-	-
Cassava	-	-	-	13,107	-	-	-	-
Coffee robusta	11,000	3,000	14,000	-	39,000	9,000	48,000	40.9

a) UG.GOV.: District Files, Kigezi (in acres).

Source: UG.GOV.: Rep. on Ug.Cens. of Agr. loc.cit., Vol. III.

Table 22. Mean Plot Size in Kigezi

Crop	DAO Report 1950 acres	Agric.Census 1963 acres	DAO Report 1965 acres	DAO Report 1968 acres
Plantain	0.22	0.39	0.22	0.20
Sorghum	0.64	0.27	0.64	0.27
Finger Millet	0.26	0.24	0.26	0.23
Maize	0.09	0.20	0.09	0.24
Wheat	0.09	-	0.15	0.10
Bean	0.11	0.22	0.11	0.21
Pea	0.15	-	0.15	0.20
Groundnut	0.15	-	0.15	0.12
Sweet Potato	0.11	0.18	0.11	0.21
Potato sol.	0.05	-	0.05	0.14
Cassava	0.05	-	-	0.12
Coffee robusta	0.34	0.29	-	-

Source: UG.GOV.: District Files, Kigezi. Rep.on Ug.Cens.of Agr., loc.cit., Vol. III.

Table 23. Mean Plot Size in the Vegetable Growing Counties Ndorwa, Rukiga and Rubanda 1967

Crop	Ndorwa County acres	Rukiga County acres	Rubanda County acres	Average acres
Plantain	0.23	2.99	0.09	1.10
Sorghum	0.18	0.22	0.18	0.19
Finger Millet	0.16	0.13	0.13	0.14
Maize	0.14	0.12	0.14	0.13
Wheat	0.14	0.11	0.10	0.12
Bean	0.24	0.13	0.12	0.16
Pea	0.18	0.13	0.17	0.16
Groundnut	-	0.13	-	0.13
Sweet Potato	0.14	0.14	0.14	0.14
Potato sol.	0.10	0.08	0.08	0.09
Cassava	-	0.04	-	0.04
Coffee arabica	-	-	0.09	0.09
Tobacco, air-cured	0.05	0.10	0.08	0.08

Source: Survey undertaken by the author.

Most valleys in South-Kigezi are covered by swamps. These level areas appear to the stranger as ideal for introducing big scale mechanisation and modern methods of crop production. Two types of swamps have to be differentiated:

- overgrown lakes with a peat cover up to 20 - 25 ft. thick. They cannot be used for agricultural production.
- papyrus or herb peat soils. Ideal conditions can be found along the edges of these swamps where the swamp peat has been mixed by eroding soils from the hills. These soils can bring the highest yields.

Drainage of swamp areas lies under the technical supervision of the Department of Water Development. Difficulties usually arise from the maintenance costs. Since 1967 this maintenance is put under the Local Administration.

Table 24. Reclaimable and Cultivatable Swamp Areas in Kigezi District

Swamp	Total Area in acres	Area Suited for Drainage and Cultivation in acres
Kiruruma South	5,950	4,300
Kiruruma North	3,000	1,870
Kashambya	2,020	680
Kigeyo	6,250	470
Other Swamp Areas	7,700	3,500
Total	24,920	10,820

Source: UG.GOV.: A. GIBBS and Partner, loc.cit., p.69.

Table 25. Main Swamps in Kigezi, 1963

Swamp	Total Area in acres	Reclaimable Area in acres	Area Drained in acres
Kashambya	2,020	1,230	780
Kiruruma South	5,950	4,300	2,110
Kiruruma North	3,000	1,870	1,130

Source: UG.GOV.: District Files, Kigezi.

Table 26. Degree of Cultivation of Swamps in Kigezi, 1963

Swamp	Area Drained in acres (I)	Area Cultivated in acres (II)	(II) as % of (I)
Kashambya	780	620	79.5
Kiruruma South	2,110	1,380	65.4
Kiruruma North	1,130	710	62.8

Source: UG.GOV.: District Files, Kigezi.

Table 27. Share of Crops in Drained Swamps in Kigezi, 1963

Swamp	Area Cultivated in acres	Area per Crop of Cultivated Swamp Area in %				
		Sw.Pot.	Maize	Sorghum	Beans	Others
Kashambya	619	56	15	24	2.5	2.5
Kiruruma South	1,380	80	17	3	4	-
Kiruruma North	710	79	10	3.5	2	5.5

Source: UG.GOV.: District Files, Kigezi.

To clarify questions concerning swamp cultivation the "Kigezi Control of Swamp Rules" were introduced in 1967, based on bye-law proposals from 1962: In each County where there are swamp areas a "Swamp Advisory Committee" has been installed. Members are:

- the County Chief of the County concerned
- the sub-County Chief concerned
- the District Agricultural Officer or his representative
- the District Veterinary Officer or his representative
- the District Water Development Officer
- a representative of the sub-County Council
- a representative of the Muluka Council
- a representative of the land owners.

This committee should meet at least every three months. They establish a swamp development plan for their respective swamp area which points out:

- areas for cultivation
- areas for grass land (pasture)
- strips, 12 ft. wide, along both sides of the main channels
- areas eventually for other purposes.

Only the committee can allocate land to the head of a family according to need. The area allocated is not to exceed 5 acres. The applicant has to sign a contract determining the rent, the conditions of swamp use, the duties of clearing channels and describing the boundaries and how to maintain them. Failure to obey the conditions will lead to fines of up to sh. 50 or loss of the right of use.

Crop Farming

As can be gathered from table 20 and table 23, Kigezi with its wide climatical range, provides ecological pre-conditions for many tropical, sub-tropical and temperate plants. By selecting adequate varieties the list of crops could even be extended. The limiting factor in crop industry for Kigezi is its land-locked situation and the long distance to the main consumer centres.

Mainly subsistent crops are:

Banana/Plantain	(Musa paradisica)
Sorghum	(Sorghum vulgare)
Finger Millet	(Eleusine corocana)
Maize	(Zea mays)
Wheat	(Tritium vulgare)
Bean	(Phaseolus vulgaris)
Pea	(Pisum sativum)
Sweet Potato	(Ipomea batatas)
Potato, sol.	(Solanum tuberosum)
Cassava	(Manihot utilissima)
Groundnut	(Arachis hypogaea)

Soya Bean	(Glycine maxima)	
Pigeon Pea	(Cajanus cajan)	in small quantities
Simsim	(Sesamum indicum)	
Gram	(Phaseolus mungo)	
Marrow	(Cucurbita pepo)	

Cash crops are:

Coffee arabica	(Coffea arabica)
Coffee robusta	(Coffea robusta)
Vegetables	(different kinds)
Tea	(Camellia sinensis)
Tobacco, flue-cured	(Tobacco spp.)
Tobacco, air-cured	
Cotton	(Gossypium spp.)
Castor seed	(Ricinus communis).

In the following a short description is given of crops grown in South-Kigezi[1]:

Banana

There are three kinds to be distinguished, which grow in Kigezi, mainly in the North and in favourable micro-climatical sites in the South: Plantain, cooking banana, and sweet banana[2]. When these varieties were introduced in Kigezi is not known. EMIN PASHA and STUHLMANN found in 1891 extended banana plantations in Ankole[3]. Under favourable conditions the plant needs 18 months to yield.

Sorghum

Sorghum can be regarded as the main cereal in altitudes above 5,500 ft. commanding of a multitude of local varieties[4]. Because

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1) J.M. BYAGAGAIRE: A Summary of Agr.in Kigezi Dist., loc.cit.

2) N.W. SIMMONDS: Bananas. London 1964, p. 215

3) F. STUHLMANN: loc.cit., p.258.

4) D.N. McMASTERS: A Subsistence Crop Geography of Uganda, The World Land Use Survey, Occas.Papers, No.2, Cornwall 1962, p.55.

of its importance the best sites and soils are chosen for its cultivation. Besides its role as a food crop, Sorghum is widely used for brewing beer. In regard to its high nutritive value the beer must be counted among the main foodstuff in South-Kigezi.

The dry stalks are used for thatching houses and stores, as fuel and for mulching purposes. Sorghum does not store well as it is subject to heavy beetle attacks.

Finger Millet

In the lower and warmer parts of Kigezi, like Ruzhumbura, Finger Millet is the main grain crop, being planted as the first crop after fallow. In the higher parts, in South-Kigezi, it is usually broadcast into standing maize when weeding it in September-October. Finger Millet has good storing capacities.

Maize

All over the District it is regarded as an important food crop. Besides, maize is a cash crop as well. Usually it follows Sorghum in the rotation and is planted in mixed stand with beans.

Wheat

Around Lake Bunyonyi and in Bufumbira wheat is grown in small quantities and mainly consumed locally.

Beans

Together with pea it is the main leguminous crop, serving as staple food and as green vegetable (leaves as well). Beans are mostly grown mixed with maize, sorghum, sweet potato, potato sol., and in young coffee and banana plantations. The low storing qualities sometimes lead to seed shortages.

Peas

Rotation after fallow often starts with peas. It is a most labour extensive crop, as it is sown broadcast into the un-

cultivated land and worked into the soil by rough digging. There is no weeding until harvest. Sometimes peas are grown mixed with maize and beans. Like beans, peas represent a most valuable green vegetable source, as well as being preserved as dried seeds. Higher yields are obtained in higher altitudes. Peas can be well stored, thus being the main food reserve in South-Kigezi. The crop was introduced via Ruanda into the District[1].

Sweet Potatoes

Already in 1891 it was commonly grown in Kigezi[2], As sweet potatoes are planted all through the year it has no fixed place in the rotation system. The quick growth, which oppresses weeds and the deep digging needed when harvesting, commend sweet potatoes as the first crop after fallow. Sweet potatoes are one of the first plants in swamp cultivation as well.

Potatoes sol.

Compared with sweet potatoes, the shorter production period in higher altitudes contributes considerably to its popularity among people mainly in South-Kigezi. The cultivation methods used in growing sweet potatoes are usually adopted for potatoes sol. as well: two rows per ridge, what together with negative selection and cutting of seed potatoes results in rapid decrease in productivity.

Marrow

Local varieties can be noticed within other crops, mainly beans. The average maturing period is three months[3].

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1) UG.GOV.: District Files, Kigezi.

2) F. STUHLMANN: loc.cit., p.260.

3) G.B. MASEFIELD: A Handbook of Tropical Agriculture. London 1965, p.124.

Table 28. Yields of the Main Crops

Crop	Distr.Agr.Off. Kigezi 1968 a) lb/acre	MAC DONALD 1963 b) lb/acre	BYAGAGAIRE 1962 c) lb/acre
Plantain	6,720	6,720	250 bunches
Sorghum	2,000	600	1,500- 3,000
Finger Millet	1,500	600	1,000- 1,500
Maize	1,000	800	500- 1,500
Wheat	1,500	-	-
Bean	650	200	300- 1,000
Pea	750	200	500- 1,000
Groundnut	600	800	300- 1,000 d)
Sweet Potato	6,720 e)	6,720	6,720-11,200
Cassava	11,200	11,200	11,200

a) UG.GOV.: District Files, Kigezi

b) A.S. MAC DONALD: Some Aspects of Land Utilization in Uganda. East African Agricultural and Forestry Journal, Vol. XXIX, No.2, 1963, p.148. These figures refer to Uganda as a whole.

c) J.M. BYAGAGAIRE: A Summary of Agr. in Kigezi, loc.cit., p.4 ff.

d) Shelled nuts

e) In swamps yields are 11,200 lb/acre

Table 29. Percentage of Holders Growing the Crop, Number of Plots per Holder Growing the Crop, and Average Area per Holder Growing the Crop in Kigezi, 1963

Crop	Holders Growing %	Number of Plots per Holder Growing	Average Area per Holder growing acres
Plantain	65.6	1.3	0.50
Sorghum	77.1	6.5	1.80
Finger Millet	44.7	2.8	0.68
Maize	80.5	2.5	0.50
Bean	96.3	5.0	1.08
Pea	52.5	-	-
Groundnut	16.7	1.7	0.31
Sweet Potato	93.3	4.1	0.71
Coffee Robusta	40.9	1.4	0.40

Source: UG.GOV.: Rep.on Ug.Cens.of Agr., loc.cit., Vol. III.

The following table has been collected from the monthly planting and harvesting reports 1967/68 of the chiefs in Kigezi by the District Agricultural Office, Kigezi:

Table 30. Planting and Harvesting of the Main Crops in Kigezi 1967/68

Crop		Percentage of the Annual Crop Acreage											
		Ja.	Fe.	Ma.	Ap.	Ma.	Jn.	Jl.	Au.	Se.	Oc.	No.	De.
Plantain	pl.[a] / ha.[b]	5	5	10	15	5	10	5	5	5	15	10	10
				no fixed harvesting time									
Sorghum	pl.	28	20	8	1	-	-	-	1	5	2	-	35
	ha.	-	1	5	2	-	35	28	20	8	1	-	-
Finger Mi.	pl.	1	2	1	-	-	-	-	2	33	50	6	5
	ha.	50	6	5	1	2	1	-	-	-	-	2	33
Maize	pl.	4	6	10	2	2	-	-	-	22	40	12	2
	ha.	40	12	2	4	6	10	2	2	-	-	-	22
Wheat	pl.	-	-	6	40	10	-	-	-	-	4	30	10
	ha.	-	4	30	10	-	-	6	40	10	-	-	-
Bean	pl.	2	6	10	15	9	1	1	-	6	15	16	19
	ha.	16	19	2	6	10	15	9	1	1	-	6	15
Pea	pl.	-	3	35	23	3	-	-	-	3	8	25	-
	ha.	8	25	-	-	3	35	23	3	-	-	-	3
Groundnut	pl.	-	16	40	20	-	-	-	-	12	10	2	-
	ha.	12	10	2	-	-	16	40	20	-	-	-	-
Sw.Potato	pl.	8	8	9	11	10	14	2	5	6	11	11	5
	ha.	5	6	11	11	5	8	8	9	11	10	14	2
Potato, sol.	pl.	4	5	8	9	13	12	9	3	4	4	19	10
	ha.	4	14	10	4	5	8	9	13	12	9	3	4
Cassava	pl.	7	9	9	10	6	9	8	6	8	10	10	8
	ha.	9	9	10	6	9	8	6	8	10	10	8	7
Tobacco	pl.	3	-	3	14	22	2	1	-	5	30	15	5
air-cured	ha.	5	30	15	5	3	-	3	14	22	2	1	-
Tobacco	pl.	-	-	25	25	-	-	-	25	25	-	-	-
flue-cured	ha.	-	-	-	-	15	20	15	-	-	15	20	15
Coffee ar.	pl.	-	-	15	15	-	-	-	-	-	35	35	-
	ha.	-	-	10	25	30	5	-	-	-	-	-	-
Coffee ro.	pl.				planting stopped								
	ha.	-	5	10	15	20	30	15	5	-	-	-	-
Cotton	pl.	-	-	-	-	-	-	47	53	-	-	-	-
	ha.	-	17	23	60	-	-	-	-	-	-	-	-

a) pl. = planting

b) ha. = harvesting

Source: UG.GOV.: Unpublished investigations by the District Agricultural Office, Kigezi, 1967.

Table 31. Seasons of Principal Crops in Kigezi

Crop	Time of Planting	Time of Harvesting
Sorghum	Dec.-Jan.	June-July
Finger Millet	Aug.-Sept.-Oct.	Dec.-March
Maize	Aug.-Sept.	Jan.-Febr.
Bean	Apr.-May and Sept.	July-Aug. and Dec.
Pea	Sep. and April	Jan. and Aug.
Sweet Potato	all over the year	

Source: J.M. BYAGAGAIRE: loc.cit., p.8.

Table 32. Maturing Period of Principal Crops in Kigezi (Months)

Crop	District Files 1936 a)	BYAGAGAIRE 1962 b)	Rep.on Ug. Cens.of Agr. 1963 c)	Annual Rep. of Agr.Dep. 1968 d)
Sorghum	7	ca.6	5.5	7-8
Finger Millet	6	4-6	5	4-5
Maize	5	4-6	4.5	4-5
Bean	3.5-4	2.5-4	3.5	4
Pea	5	ca.4	-	4-5
Groundnut	-	-	4.5	4-5
Sweet Potato	5	5-7	6	5-6
Potato, sol.	3	-	-	3-4
Marrow	4	-	-	-
Vegetable	4	-	-	-
Tobacco	4	-	-	-
Cassava	-	-	-	12-24
Wheat	-	-	-	5

a) UG.GOV.: District Files, Kigezi

b) J.M. BYAGAGAIRE: A Summary of Agr. in Kigezi, loc.cit., p.4 ff.

c) UG.GOV.: Rep. on Ug.Cens. of Agr., loc.cit., Vol. III. The original figures were in days.

d) UG.GOV.: Kigezi District Annual Report, Department of Agriculture, 1968, p.5.

Planting times of a crop depend of course on the altitude as well as on the climatic conditions of the particular year. In 1939 a plot was cultivated until a remarkable decrease in productivity could be noticed. Then the field was left fallow for two to eight years. The period of resting depended on farm size, soil fertility, regeneration of the soil, the degree of grazing and the judgement of the individual. Of course, more distant fields were given longer fallow than those closer to the homes[1]. This system was quite satisfactory as long as the population density was not too high to interfere with the normal period of resting required to regain fertility.

A proper rotation system has so far only been adopted by progressive farmers. Quality of land and distance to the home are mostly the factors determinating choice of crop. In general, the farmers follow a rough system of rotation differing according to altitude. (See table 33.)

Cultivation measures depend on the intended crop. Seeds are in most cases broadcasted into the unweeded land, before digging it with the hoes. Weeds are removed and gathered along the edges of the terraces or burnt. Only Sweet Potatoes are nearly always planted in ridges and rows.

Weeding is seldom done more than twice per year. Of course, climatical conditions, e.g. the kind and the time of rains, etc. play an important role. The tool for weeding is preferably in old worn-out hoe, as it is blunt and not so heavy.

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1) UG.GOV.: District Files, Kigezi.

Table 33. Different Rotation Systems Practiced in Kigezi

Year	Crop
1st year	Sorghum, Finger Millet
2nd year	Maize, Beans, Peas mixed stand
3rd year	Sorghum, Finger Millet
4th year	Potatoes,sol., Sweet Potatoes, fallow
5th year and more	fallow
1st year	Finger Millet, Maize, Beans[a]
2nd year	Sorghum, Maize, Beans
3rd year	Sweet Potatoes
4th year	Peas, Sorghum
5th-8th year	fallow

	High Altitude	Low Altitude
1st year	Peas	Finger Millet
2nd year	Sorghum	Groundnut
3rd year	Maize, Beans	Maize, Beans
4th year	Sweet Potatoes	Sweet Potatoes
5th year and more	Finger Millet fallow	Plantain or Cassava, or Coffee or fallow

a) Maize, beans and peas often in mixed stand.

Sources: UG.GOV.: District Files, Kigezi
J.M. BYAGAGAIRE: A Summary of Agr.in Kigezi, loc.cit., p.9.

Seeds

The necessary seeds are usually obtained from the yield of the previous year. The farmers apply a certain selection. The local people are following certain traditional rules which are easily neglected by strangers or newcomers. The lack of land makes higher yields necessary. Therefore, the Department of Agriculture tries to distribute "improved seed". The amount of improved seed sold by the Kigezi District Farm Institute is shown in table 34.

Table 34. Sales of "Improved Seed" to Farmers in Kigezi 1967 and 1968

Seed	1967 lb	1968 lb
Sorghum	222	-
Maize	107	-
Wheat	43	2,250
Barley	-	60
Beans	2,292	615
Peas	166	50
Potato, sol.	120	-

Source: UG.GOV.: District Files, Kigezi

A Seed Multiplication Project for the whole of Uganda is in preparation[1]. At present the seeds are multiplied at the District Farm Institute. Coffee seedlings are obtained from local supplies and tea stumps come from Toro. Tobacco seed is provided by the firm buying the tobacco.

II. MARKETING PRE-CONDITIONS

1. HABITS OF CONSUMPTION

Crops serving as staple foods in Kigezi are: peas, finger millet, beans, sorghum, and sweet potatoes. Cassava and groundnuts can be added in North-Kigezi.

Peas and finger millet have excellent storing qualities whereas beans and sorghum can only be kept for limited periods (weevils). As sweet potatoes need not be harvested after a certain period and might be kept for some time in the soil they must be regarded as the safest food reserve, particularly

1) UG.GOV.: Work for Progress. Uganda's Second Five-Year Plan 1966-1971, p.62.

in the swampy areas of South-Kigezi. Groundnuts, widely grown in North-Kigezi, find a good market all through the District.

Maize, yams, potatoes sol., marrows and plantain are well established foodcrops in the diet of the people. Local vegetables take a remarkable share in the meals. Meat is rarely consumed. An average farmer in Kigezi has meat two to three times a year, mainly from goat or chicken[1]. Formerly, the only animal protein not taboo for women was beef[2]. They were not allowed to eat mutton, goat or chicken. Beef supply depended almost entirely on the occasional death of a cow, whether by accident or illness[3]. Thus the only protein supply for women in Kigezi, the Bakiga in particular, came from plants like beans, peas and sorghum.

These habits of consumption have slackened. But as the attitude towards cattle representing wealth, has not changed and the other protein suppliers are used to gain cash, people's supply of animal protein is still at a low level.

Fish are only eaten near lakes and rivers. Although Kigezi with its richness in water resources would offer ideal preconditions for a fish pond industry most of the trials, at times very costly, failed because of the pond owners' lack of managerial abilities. In 1967 in Kigezi 1,680 ponds were stoched, cropping 23.2 tons[4].

Occasional protein supply comes from termites and locusts. Until the end of the twenties frogs were a valuable protein supplement in parts of South-Kigezi. According to season, mushrooms

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1) UG.GOV.: District Files, Kigezi.
2) M.M. EDEL: loc.cit., p.83.
3) M.M. EDEL: loc.cit., p.81.
4) UG.GOV.: District Files, Kigezi.

bring some variety into the meals[1].

Nearly all food mentioned, including herbs and vegetables, are eaten cooked, fried or roasted. The main meal is taken in the evening. The next morning cold left-overs from the day before are used. For field work and when travelling people prefer thin porridge made of sorghum, "obushera". The container for this is the calebash, made from Lagenaria vulgaris, which is commonly used in Kigezi for carrying any liquid.

Salt comes from the salt lakes area around Katwe at the Northern shores of Lake Edward.

In the past fruits were collected from indigenous plants. High population density and intensive cultivation of land crowded out most of the wild flora. Now, many farmers are growing some tree-tomatoes (Cyphomandra betacea), mountain paw-paws (Carica candamarcensis) or passion fruits (Passiflora edulis) within or close to their farmstead. When cash is available, e.g. after market days, farmers tend to purchase some bisquits, scones or small cakes. For special occasions, like weddings etc., in addition to the obligatory cooking bananas ("Matoke") rice is prepared.

Kigezi is commonly known for its high sorghum beer consumption. In 1926 the District Commissioner estimated eighty per cent of the sorghum yield to be used for beer production. This figure might be too high for the present situation, but the Annual Report of the District Agricultural Officer in 1967 states: "... Although we had a good harvest of sorghum, excess drinking and selling led to localised shortages which caused grave concern to the department and local administration..."[2].

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1) UG.GOV.: District Files, Kigezi. G.B. MASEFIELD: loc.cit., p.117.

2) UG.GOV.: District Files, Kigezi.

In general the high share of beans and peas in the diet of the population of Kigezi guarantees an adequate protein supply. Local and exotic vegetables are available almost throughout the year and due to the fact that food is often eaten under-cooked one might be right in assuming that a sufficient amount of vitamins is provided.

2. EXISTING MARKET OUTLETS

Rudimentary markets were already existing in Kigezi before the arrival of European administrators[1]. There had been no regular medium of exchange, or even a consistent system of relative values. According to EDEL: "... the hoe was the closest approach to a unit for purposes of calculating exchange..."[2]. Food, beer, hoes, and stock in particular were used in exchange[3]. Whereas salt and clay pipes were main articles imported from outside Kigezi[4]. Now considerable amounts of goods are being handled at local markets. There are forty weekly markets held in Kigezi. Kabale township has an established market open throughout the week.

In 1967 the District Agricultural Office issued 172 "Primary Produce Licences" to traders enabling them to buy products directly from the producers[5]. Holders of these licences are bound to submit the returns to the District Agricultural Office. In event of failing to do so, the licenced buyers are refused renewal of their licences. In future, Primary Produce will be handled by the newly established "Produce Marketing Board" under the "Produce Marketing Board Act, 1968" which replaces the "Produce Marketing Act, 1964".

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1) B.K. TAYLOR: loc.cit., p.123
2) M.M. EDEL: loc.cit., p.91
3) B.K. TAYLOR: loc.cit., p.122
4) H. INGRAMS: loc.cit., p.114
5) UG.GOV.: District Files, Kigezi

Table 35. Average Prices for Farm Produce, in Kigezi 1967 and 1968

Produce	1967 sh./lb	1968 sh./lb
Sorghum	0.25	0.23
Sorghum, germin.	0.30	-
Finger Millet	-	0.19
Maize	0.05	0.66
Beans mixed	0.30	0.21
Peas field	0.25	0.26
Groundnuts shelled	0.60	0.55
Sweet Potatoes	0.06	0.08
Potatoes sol.	0.15	0.20
Cassava	0.10 per root	0.05
Plantain bunch	5.00	5.00
Castor Seeds	0.25	0.25

Source: UG.GOV.: District Files, Kigezi.

Table 36. Minimum Prices for Controlled Produce, in Kigezi 1967 and 1968

Produce	1967 sh./lb	1968 sh./lb
Sorghum	0.12	0.17
Finger Millet	0.20	0.15
Maize	-	0.07
Beans mixed	0.18	0.15
Beans black	0.30	-
Peas	-	0.20
Groundnuts	-	0.50
Green Grams	0.35	-
Simsim	0.50	-

Source: UG.GOV.: District Files, Kigezi.

Farm produce exported from Kigezi are in the first place cash crops, such as coffee, vegetable, tea, tobacco, etc., of which exact export figures are available. Besides, large quantities of primary produce, namely beans, finger millet and maize leave the District to consumer centres like Kilembe Mines, Mbarara, Masaka, Kampala and even Jinja. They also are difficult to locate and estimate. An essential link in marketing agricultural products are the co-operatives.

3. TRANSPORT CONDITIONS

a. TRANSPORT FROM PRODUCER TO BUYER

The major part of agricultural produce is carried as head load along narrow paths to the roads and the marketing centres located there. The road system of Kigezi can be regarded as comperatively good. However, the farmers have to cover an average distance of 3 to 6 miles to the trading places. The hilly nature of the country and the swamps often found in valleys complicate transportation. Where the landscape is more level or roads are available the bicycle is the essential means of transport. Along the roads, if goods are too bulky or heavy, and the market too far away, the bus, taxi, or pick up of a trader are used.

b. TRANSPORT LINKS TO THE MARKETING CENTRES OUTSIDE KIGEZI

As early as 1920 Kigezi was opened to light motorcar traffic. Gradually the Kampala-Kabale-Congo road developed into a main transit link for heavy transporters. The construction of the railway line to Kasese at the foot of the Ruwenzori drew the main traffic to the North. It is known that the road system of Uganda is well planned and maintained. The Government is furthermore concerned about its completion and extension[1]. At the beginning of 1967 a road construction firm began the building of the last piece of the road link to Kampala. When this is accomplished the transport time to Kampala will be reduced considerably and the transport for highly perishable products like vegetables or eggs can be performed faster and safer.

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1) UG.GOV.: Work for Progress, loc.cit., p.119 ff.

Most of the transport facilities, except those for passengers, are not fully used on the Kigezi-Kampala route. As more goods have to be provided for the consumers in Kigezi than are exported from Kigezi, the Kigezi Vegetable Co-operative Union can hire transport on a one way basis only.

Table 37. Distances to Places outside Kigezi

Route	Distance in miles
Kabale - Mbarara	92
Kabale - Masaka	184
Kabale - Kampala	265
Kabale - Jinja	315
Kabale - Kasese (railhead)	135
Kabale - Kigali (Ruanda)	90
Kabale - Gena (Congo)	104
Kabale - Nairobi (Kenya)	672
Kabale - Mombasa (Kenya)	979

Source: Road Map of East Africa.

Kabale has an air field which can be approached by smaller planes. A hydroplane landed several times on Lake Bunyonyi.

III. ORGANIZATIONAL PRE-CONDITIONS

1. TRADITIONAL FORMS OF ORGANIZATION

The Bakiga who make up most of the population are a conglomerate of tribes and clans who had never been under a king or a similar head[1]. The clan was guided by the elders. They guaranteed safety to the individual by trying to settle quarrels in a peaceful way or by defending the clan

1) H. INGRAMS: loc.cit., p.212.
M.M. EDEL: loc.cit., p.2 ff.

against intruders[1]. Co-operation often extends beyond the family, e.g. in house building, herding and building of water troughs thus ensuring the others help when there is need for it[2]. The youths in particular get together during the digging of one another's plot. These traditional forms of co-operation can be recognized in activities like road building, swamp reclamation or co-operative store building programmes.

2. ADMINISTRATIVE FORMS OF ORGANIZATION

Kigezi District is partly administered by the Central Government of Uganda, partly by the Local Administration. The District Commissioner is the highest ranking official whereas the Secretary General is elected as the political head of the District.

Kigezi District is divided into the following units:

- 6 Counties (Saza) under 6 Saza Chiefs
- 35 Sub-Counties (Gombolola) under 35 Gombolola Chiefs
- 233 Mulukas under 233 Muluka Chiefs.

They are supervised by the Local Administration whose head is the Administrative Secretary.

The particular ministries of the Central Government of Uganda are represented by their District Officers. They are subordinates of the District Commissioner who himself is an officer of the Ministry of Public Service. According to the Constitution of 1967 the District Commissioner is the body supervising the Local Administration.

Under the Department of Agriculture of the Ministry of Agriculture and Forestry the following officers were working in the District during 1968:

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1) B.K. TAYLOR: loc.cit., p.122. M.M. EDEL: loc.cit., p.22.

2) B.K. TAYLOR: loc.cit., p.120. M.M. EDEL: loc.cit., p.86.

- 1 District Agricultural Officer
- 1 Agricultural Officer (Horticulture) (left in November 68)
- 1 Assistant Agricultural Officer (Horticulture)
  + 6 Field Assistants
- 1 Assistant Agricultural Officer (Tobacco)
  + 5 Field Assistants
- 1 Assistant Agricultural Officer (Tractor Hire Service)
  + 1 Agricultural Assistant
- 2 Assistant Agricultural Officers (Coffee)
  + 1 Agricultural Assistant
  + 12 Field Assistants
- 6 Assistant Agricultural Officers (one for each County)
  + 6 Agricultural Assistants (one for each County)
  + 7 Field Assistants (Ndorwa County)
  + 4 Field Assistants (Rubanda County)
  + 6 Field Assistants (Rukiga County)
  + 6 Field Assistants (Bufumbira County)
  + 6 Field Assistants (Kinkizi County)
  + 9 Field Assistants (Ruzhumbura County)
- 1 Assistant Agricultural Officer (Principal District Farm Institute)
- 1 Assistant Agricultural Officer (Nutrition)
  + 2 Agricultural Assistants (District Farm Institute)
  + 3 Field Assistants
  + 2 Field Assistants (Ox Cultivation)
- 3 Clerks (Kabale District Agricultural Office)
- 2 Clerks (District Farm Institute)

3. COMMERCIAL AND CO-OPERATIVE FORMS OF ORGANIZATION

The middlemen handling salt can be regarded as the first African traders within South-East Kigezi[1]. Together with the arrival of the first European administrators traders mostly of Asian origin started business in Kigezi. INGRAMS describes the Government's action in 1901 as follows: "...One of the most

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1)B.K. TAYLOR: loc.cit., p.122.

curious things about the development of trade was the Government's action in fixing the cost of a trading licence at R.150 or about 10 Pounds in 1901..."[1]. In 1914 the Asians had entered trading in Kigezi almost completely. The Repor of the District Commissioner of 1930 mentions that the Asians were capturing much of the trade which had formerly been in the hands of African, e.g. salt and fish[2].

The first shops for African traders in Kabale were allocated in 1949, opposite the Kabale market. So far trading by Africans had been at the market only[3]. In the villages African traders had established their shops. They play an increasing role in the turnover of goods. When talking with young farmers it is often found that their secret hope is to own a shop someday. They usually start with a few goods like kerosene, candles, matches and sugar. The example of the now well-off shop owners appears to them as the ideal way of earning one's living

The co-operative movement and the co-operative marketing in Kigezi started with the posting of the first District Co-operative Officer to Kigezi in 1961. He was seconded by two Assistants. His first task was to help the founding of the first Co-operative Society in Kigezi, the "Kigezi District Growers Co-operative Society" commonly known as the Vegetable Society, on March 13th, 1961. In the meantime the co-operative movement in Kigezi has expanded considerably.

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1) H. INGRAMS: loc.cit., p. 114.

2) UG.GOV.: District Files, Kigezi.

3) The share of Africans in retail business increased between 1953 and 1963 from 18 to 33 per cent. J. BUSE and J. HEIDERMANN: Erwachsenenbildung in Afrika Teil 1, Ost- und Zentralafrika. Stuttgart 1967, p 65.

Table 38. Development of the Co-operatives in Kigezi

	1963	1964	1965	1966	1967
Primary Societies	15	20	33	33	35
Unions	1	1	3	3	3
Total	16	21	36	36	38

Source: UG.GOV.: District Files, Kigezi.

Table 39. Development of Membership, Share Capital and Turnover of the Co-operatives in Kigezi

	1965	1966	1967
Membership	7,270	8,161	9,106
Share Capital shs.	177,333	235,245	272,355
Turnover in shs.	-	1,744,881	2,414,351

Source: UG.GOV.: District Files, Kigezi.

Within the co-operative extension service in Kigezi there were working in 1968:

- 1 District Co-operative Officer (acting)
- 1 Assistant Co-operative Officer
  + 6 Co-operative Assistants
  + 6 Co-operative Supervisors.

D. DEVELOPMENT, SET-UP AND OPERATION OF THE VEGETABLE SCHEME IN KIGEZI

I. DEVELOPMENT OF VEGETABLE GROWING IN KIGEZI BEFORE 1951

1. INDIGENOUS VEGETABLES IN KIGEZI

Local herbs and vegetables comprise a large part of the diet of the people of Kigezi. All of the farmers questioned preferred eating local vegetables. The consumption, however, depends largely on the seasons. In very few cases these vegetables are grown and cultivated separately. They are collected in the fields often growing as weeds and eventually getting some care by selective weeding[1]. Women and girls are responsible for gathering the plants or parts of the plants in season daily. In addition, parts of subsistence crops such as the leaves of beans, yams, marrows, etc. are used as vegetables.

Table 40. Local Vegetable Kinds

Botanic Name	Local Name	Part of the Plant Eaten
Solanum nodiflorum	Eshwiga	young shoots
" " spp.	Otandenga	"
Gynandropsis gynandra	Eshoje	"
Amaranthus blitum	Enyabutongo	"
" " spp.	Ekitongotongo	"
" polygamus	Omuliri	"
Urtica maissaica	Ekikuriganyi	"
Basella alba	Enderema	"
Malva verticillata	Ekituruguma	"
Brassica schimperi	Eshaaga	"
Solanum spesiosum	Entakara	fruit
Solanum melongeno (?)	Entura	"
Cucurbita pepo	Ekishuusha	leaves
Dioscorea spp. (Yams)	Amatekyere	"

(cont'd)

1) G.B. MASEFIELD: loc.cit., p.117. H.D. CREMER: Verbesserung der Ernährungssituation in Ostafrika. Wissenschaftliche Schriftenreihe des Bundesministeriums für Wirtschaftliche Zusammenarbeit, Band 4, Stuttgart 1966, p. 38 ff.

Table 40 (cont'd)

Botanic Name	Local Name	Part of the Plant Eaten
Pisum sativum (Peas)	Omukoryo	leaves + fruit
Phaseolus vulgare (Beans)	Ekishoma	" "
Capsicum frutescens	Eshenda	fruit
Vigna catiang (Cow Pea)	Enkole	"
Phaseolus aureus (Gr.Grams)	Enkuku	"
Cajanus cajan (Pigeon pea)	Entondeigwa	"

2. INTRODUCTION OF EXOTIC VEGETABLES

As a rule, it can be assumed that together with the appearance of European traders, settlers, missionaries, or officials, European vegetables have been introduced. The same applies to vegetables of other origins. Accordingly, the first District Commissioner of Kigezi mentions in his first report of 1913/14 that European vegetables are growing well in Kigezi.

Obviously the number of kinds and varieties slowly increased. This housegarden production is still very common among expatriates. Soon the African population started growing and eating those exotic vegetable types which were similar to their indigenous plants in taste and methods of preparation such as White Cabbage, Potato sol., etc.

In the following the officially mentioned dates of introduction of the particular vegetables have been recorded[1]:

1) Not separately quoted sources are the District Files, Kigezi, and interviews. Newly introduced vegetable kinds are noted in connection with the Latin name.

1913/14 Introduced European vegetables are growing well (not specified).

1919 J. ROSCOE writes[1]: "... In Kigezi, Mr. Phillips, the Commissioner had a wonderful English garden in which potatoes, turnips, carrots, celery and cauliflower grew freely. His strawberries were the finest I have seen or tasted in Africa...". (Potato sol. (Solanum tuberosum), Turnip (Brassica rapa), Carrot (Daucus carota), Celery (Apium graveolens var.dulce), Cauliflower (Brassica ol.var.botrytis)).

1923/24 In a few cases farmers have taken up market gardening with keenness even growing various English vegetables. No results available.

1933 That Potatoes sol. are growing in popularity in Bufumbira and around Kabale can be accounted for by the fact that they come to maturity more quickly than Sweet Potatoes.

1936 The District Agricultural Officer notes of Potatoes sol.: "... The cultivation has increased rapidly in the last ten years and the crop is now a weed...". Fresh seed of Potato sol. imported from Kenya, grown in increased plots in Kabale and distributed to selected persons to improve the local supply.

1938 Under crops for observation are mentioned: White Cabbage (Brassica ol. capitata), Swedes (Beta napus var. napobrassica) and Swiss Chards (Beta vulg.var. cicla).

1940 New variety of potatoes "Kerr's Pink" yielded 4,990 lb/acre.
Onions (Allium cepa) are noted in the diet of the people around Rwamacucu.

1941 Considerable amounts of potatoes (no exact figures) are exported to Kampala, etc.

1942 "... With a view to determining whether viable seed can be produced in this country (Uganda) small plots of the commoner vegetables should be grown and planted and the results noted...", thus reads a letter addressed to the District Agricultural Officer Kigezi from the Director of Agriculture's Office. Plants included into this test were:

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1) J. ROSCOE: loc.cit., p.108.

Beetroot (Beta vulg.var.rubra)
Broad Bean (Vicia faba)
Cauliflower
Carrot
Chinese Cabbage (Brass.pekin.)
Leek (Allium amp.porr.)
Lettuce (Lactuca sat.)
Onion
White Cabbage

Potato: Blight (Phytophthora infestans) appeared, spreading rapidly and destructively. "Kerr's Pink" highly susceptible, local blue variety less.

1943 Results of the vegetable seed production project:
Beetroot: not flowering
Broad Bean: very good results, the only new food crop which promises to be worth while introducing, the yield substantially exceeding that of local beans or peas.
Cauliflower: the most successful seeding crop.
Carrot: suffered severely from cutworm (Agrotis spp.) damage and long periods of drought, very slow to flower.
Chinese cabbage: flowered well
Leek: not mentioned
Lettuce: not mentioned
Onion: not mentioned
White cabbage: cabbage seed could be produced on a large scale.
Potato: search for blight resistant varieties. "Toro Blue" almost entirely free from blight. Spraying with copper sulphate and wasting soda.

1944 Vegetable seed production discontinued as only partial success was obtained.

1946 Onion: 100 acres planted in Bukinda sub-County.
Potato: only grown on a small scale due to the high incidence of blight. New variety "Kinongo" severely attacked by blight.

1947 Potato: a shortage of potatoes in Kampala increased the producer price to 5 cts/lb offered by the local traders, Kampala retail price = 14 cts/lb although the production was suffering from a severe blight attack.

1948 The District Agricultural Officer of Kigezi regrets in his annual report that the area around Kabale is not suited to fruit growing with the possible exception of peaches, however, by way of compensation, it produces magnificent vegetables.
Onion: in Bukinda and Kamwezi area 165 acres planted.
Potato: variety trials with:

Nyanyuki	Kigezi Blue
Kinongo	Roode Star
No. 835	Kerr's Pink
Nyeri	No. 914

1949 Onion: often grown in heavily composted plots obtaining very high yields (no figures available)
Potato: The market for potatoes in Kampala stands in correlation to Kenya imports. Variety trials show that the variety "Kinongo" gives the highest yield with 6,620 lb/acre. No. 914 infected by bacterial wilt (Corynebacterium michiganense).

1950 Tomato: Phytophthora infestans also renders tomato cultivation around Kabale a difficult enterprise.
Potato: export on permits dropped to 250 tons. Increased quantities are being consumed locally.
Tomato (Lycopersicum esculentum).

II. THE DEVELOPMENT OF THE KIGEZI VEGETABLE GROWING INDUSTRY

1. "KIGEZI INDUSTRIES LTD.", THE PRIVATE ENTERPRISE FROM 1951 TO 1961

a. THE START OF THE VEGETABLE SCHEME

In 1950 the District Commissioner of Kigezi writes: "... (the) factor of the limited amount of land coupled with the difficulty of finding a high priced crop which will grow in Southern Kigezi where most of the people live and will withstand the cost of the long road haul to the railhead are the chief drawbacks to increased economic production...".

The following year, 1951, the same officer reports: "... A scheme was begun for the growing by Africans of European vegetables for sale in Kampala... A drawback to the development of this industry is of course the long road haul to Kampala and the dependence on avoiding any long delay between the time of purchase and selling Kampala. Although the prices that can be offered to the grower are considerably less than one might expect judging from the prices charged to the consumer in Kampala there is no doubt that for a comparative few the industry can bring a handsome return...".

The Scheme originated from an inquiry from the Director of Agriculture's Office, Entebbe, as to whether vegetables could be successfully grown in Kigezi for the Kampala market. On May 5th, 1951, a meeting was held between twelve local farmers who had already been growing vegetables for local consumption, the District Commission, the District Agricultural Officer and the Secretary General of Kigezi. All growers were keen to increase production.

b. THE DEVELOPMENT OF THE KIGEZI VEGETABLE SCHEME

1.6.1951 First seeds distributed by the Department of Agriculture and further seed supplies ordered. This system was followed until 1961.

3.9.1951 First vegetables purchased and transported to Kampala.

24.9.1951 The second consignment of vegetables leaves for Kampala.

1952 Vegetables are grown within a radius of 12 miles around Kabale. The number of farmers allowed to grow vegetables is restricted to forty. The Vegetable types are quoted in table 44.
Experimental: Celriac (Avium grav.rap.) Celery, Rhubarb (Rheum rhab.), Runner Bean (Phaseolus vulg. var.comm.), Leek, Swiss Chard and Brussel Sprouts (Brass.var.gemnifera).
Potato: Blight and Ringrot (Bact. sependon.).

1953 The vegetable growers form an interest group (predecessor of the vegetable co-operative).
Experimental: Parsnip (Pastinaca sat.), Asparagus (Asparagus officinal), Artichoke (Cynara scolymus)
Potato: new varieties introduced, D 49 and M 49.

1954 Total number of growers: 278.

1955 Rubanda sub-County included into vegetable growing area.
Potato: increase in production area.

1956 System of grading introduced with price differentiations.
Pests and diseases found: Carrot Fly (Psila rosea), Celery Blight (Septoria apii), Tomato Blight

(Septoria laycop.), various species of caterpillars and aphids.
Potato: yields between 5 - 10 tons/acre.

1957 Reorganisation of the marketing arrangements in Kampala. Severe price fluctuations tend to discourage growers and lead to gluts and shortages in production
Tomato: production increased.
Pests and diseases: first spraying attempts. Vegetable pest = cut worm (Agrotis spp.), tomatoes = blossom end rot very common.

1958 Vegetable prices dropped because of Kenya and Congo imports.
Improvement of packaging for the produce: soft wood crates, cost about 0.04 sh./lb.

1959 High quality seed obtained from South Africa. Main obstacles to the vegetable producing industry are packing, transport and the distribution system at the marketing end.

1960 Unfavourable weather conditions caused shortage in supply of Kigezi vegetables, thus Kenya producers gained a big part of the Kampala market.
Potato: Kenya rules this market as well.

1961 The "Kigezi District Growers Co-operative Society Ltd." commonly known as the "Vegetable Society" founded. It took over business from "Kigezi Industries Ltd.".

c. AREA OF PRODUCTION AND NUMBER OF VEGETABLE GROWERS

In the beginning a list of "Official Growers" was kept. These were farmers whose vegetable fields had been inspected and approved. All their products were bought regardless of transport facilities and marketing outlets, resulting in considerable quantities left back at the buying centres. The Department of Agriculture was paying for the deficit until July 1952 (e.g. in March 1952 1,084.23 shs).

People not registered as "Official Growers" could sell their products to the buyer only if there was demand. They produced at their own risk.

Table 41. Development of the Number of Vegetable Growing Farmers 1951 - 1961

Sub-Counties	Number of Farmers					
	1951	1952	1953	1954	1960	1961[a]
Ndorwa County						
Buhara	-	-	50	-	-	-
Kabale	1	3	-	-	-	-
Kamuganguzi	3	6	-	-	-	-
Kitumba	4	3	-	-	-	-
Kyanamira	20	46	151	160	219	244
Maziba	3	2	80	212	177	221
Rubaya	1	1	-	-	-	-
Rubanda County						
Bubale	6	7	10	68b)	56c)	57
Bufundi	2	2	-	-	-	-
Rukiga County						
Bukinda	-	-d)	-	60	96	173
Total	40	70	291	500	492	695

a) On Jan. 31, 1961, before the Co-operative took over.

b) In 1954 Bubale had to stop vegetable production shortly.

c) After another break (not exactly specified) vegetable buying started on Dec. 7, 1960 in Bubale again.

d) Bukinda had been included into the vegetable growing area for a short period in 1952.

Source: UG.GOV.: District Files, Kigezi.

Table 41 illustrates the changes in the selection of vegetable growing areas. At last in 1954 the production area and the buying centres were streamlined along the main road, initiated by the transporter's economical efforts to have the buying centres along the transport connections to Kampala.

Table 42. Official Vegetable Buying Centres, 1960

Buying Centre		Sub-County
Bubale	in the centre of the village	Bubale
Muyumbu		Kyanamira
Kabanyonyi		Kyanamira
Nyanzha		Maziba
Kyabugombe		Maziba
Bukinda		Bukinda
Rutobo		Bukinda, Kamwezi

Source: UG.GOV.: District Files, Kigezi.

d. ACREAGE, VEGETABLE VARIETIES AND PRODUCTION METHODS

Already in 1952 the report of the Kigezi Vegetable Scheme notes that many growers had insufficient suitable land to allow for regular planting. Owners of bigger fields did not seem interested in vegetable growing Since the beginning of the Scheme holders with highly fragmented, scattered, small plots took the highest share of the vegetable growers.

Table 43. Acreage of Vegetable, Onions and Potatoes sol. 1951 - 1960

Year	Vegetable acres	Onions acres	Potat es, sol. acres
1951	5	226	7,598
1952	300	168	7,521
1953		314	5,899
1954	400	384	9,032
1955	450	648	10,520
1956	450	3,171	8,623
1957	457	2,267	11,900
1958	461	310	9,873
1959	434	432	8,999
1960	565	445	10,262

Note: The acreage figures for onions and potatoes cover the whole of Kigezi

Source: UG.GOV.: District Files, Kigezi.

A survey in 1952 showed that:

- 100 per cent of the growers had at least one plot of White Cabbage.
- 75 per cent of the growers had at least 2 to 3 plots of White Cabbage.

This situation had not much changed by 1965. Besides white cabbage proferably grown kinds were cauliflower, lettuce, and carrots. Reasons are that they are easy to produce and that they correspond with the farmers' tastes. Unfortunately, these kinds in particular were subject to severe competition from Kenya, Congo, and the producers around Kampala. In order to avoid irregular and selective production vegetable growing instructions were introduced.

Table 44. Vegetable Growing Instructions for "Official Growers" within the Kigezi Vegetable Scheme, 1952

Vegetable Variety	Production Scale and Quantities per Farmer
Beetroot	5 x 2 yds. every two weeks
Broad Bean	5 x 4 yds once per month
Brussel Sprouts	production is to be increased
Cabbage White	50 plants once per month
Carrot	5 x 4 yds every two weeks
Cauliflower	100-150 plants once per month, restricted to 7 farmers
Lettuce	100 plants once per month
Onion	production is to be increased
Pea	5 x 4 yds once per month
Potato	production is to be increased
Swiss Chard	production is restricted to 3 farmers
Turnip	5 x 2 yds every two weeks

Source: UG.GOV.: District Files, Kigezi.

If any grower did not follow these instructions he might, if necessary have been removed from the list of Official Growers and replaced by another farmer. The same happened if a grower sold products, except white cabbage and cauliflower, to other buyers. The majority of land planted with vegetables adjoined

swamps and rivers. Vegetables had not yet gained a place within the rotation plan of local crops. The farmers were advised to use a certain rotation rule insofar as not to plant the same kind on a plot twice without a break. Frequently vegetables were grown in companion cropping, e.g. lettuce or beetroot together with cauliflower with the aim of improving the soil structure and reducing soil erosion.

The District Agricultural Office ordered and distributed the seed, thereby attempting to regulate and influence the production according to the expected demand. Farmers started multiplying their own seed to save the seed bill mostly by leaving the plants which could not be sold to flower (lettuce, cauliflower, cabbage). This negative selection of seed providing plants resulted in a severe decrease in quality.

Part of the following remarks on vegetable kinds grown in Kigezi are extracts from a report on the Vegetable Scheme written by a atudent in agriculture (B.J. BYAGAGAIRE) in 1953:

- Beetroot: was often kept too long in the field so that it could not be sold.
- Broad Bean: due to easy cultivation and good prices the crop is very popular.
- Brussel Sprouts: not very common, some growers leave them to stay in bush.
- Cabbage white: very popular, close spacing is recommended to obtain smaller heads.
- Carrot: also very popular because it can stand drought well and is not subject to heavy pest and disease attacks. Efforts to encourage farmers to sow in rows, often too densely sown.
- Cauliflower: seed problems.
- Celery: too difficult to establish and too slow growth. In spite of good prices not widely grown.
- Cucumber: mostly without results.
- Runner Bean: problems in seed supply.
- Leek: is planted in ditches.
- Lettuce: very popular, around Muyumbu farmers tend to grow big quantities at the expense of other vegetables.

- Onion: due to good prices very popular. Growers use local seed which produces low quality. Not properly dried before selling.
- Pea, garden: during certain seasons severe aphid attacks.
- Potato: main production around Bubale.
- Rhubarb: difficult to get seedlings from seed.
- Swiss Chard: very popular, production has to be restricted.
- Tomato: uneconomic, rarely good quality obtained.
- Turnip: grows well, good germinating results and quick growth.

Artichoke, French Bean, Parsnip, Spring Onion were later added.

Table 45. Spacing of Vegetables, 1952
(As per Instructions for Official Growers)

Vegetable kind	Spacing in ft.
Beetroot	rows 1 ft. apart, thinned within the row to 9 in.
Broad Bean	2 ft x 3 in.
Brussel Sprouts	3 x 3 ft
Cabbage White	1 x 1 ft
Carrot	rows 1 ft apart
Cauliflower	2 x 2 ft
Lettuce	1 x 1 ft

Source: UG.GOV.: District Files, Kigezi.

Pests and diseases have already been mentioned in chapter D, II, 1, b:

- various caterpillars
- cut worm in Brassicaceae and carrots
- aphids mainly during dry season
- white ants and carrot fly in carrots
- white ants and cut worm in turnips
- Phytophthora infestans, Bacterial wilt and Ring rot in potatoes
- Blight in tomatoes
- Septoria in celery and tomatoes

- Fungi in peas and beans (no special determination)
- Fungi in onions (not specified)
- deficiencies in trace elements
- blossom end rot in tomatoes.

Extension service in the Vegetable Scheme was conducted by the Department of Agriculture from 1951 onwards. In 1957 an "Annual Vegetable Competition" was launched for the vegetable growers. Kigezi Industries provided prizes worth 200 shs. This competition was discontinued in 1961.

e. DEMAND, PURCHASES, TRANSPORT AND SALES

The Monthly Report of the District Agricultural Officer for Kigezi for September 1951 discloses: "... that there is no real shortage of European vegetable in Kampala although retail prices are high...". One of the guiding ideas when starting this scheme had however been to reduce the vegetable prices presumably raised by high demand. It seems that there had been a miscalculation in planning by mis udging the marketing system of vegetable in Uganda. The demand for Kigezi vegetables stood always in dependent relation to upplies from Kenya (White Farmer Belt) and Congo (Belgian settlers).

A European firm "Kigezi Industries Ltd." had been asked by the Department of Agriculture to purchase, trnasport and to sell the vegetables from Kigezi as they were known as the most reliable lorry owners in Kigezi. Space in most of the lorries on the Kabale-Kampala route was not utilized due to lack of available freight. Thus the approach might have been highly welcomed by the firm. In spite of this all through Kigezi Industries' ten years of operation in handling the marketing of Kigezi vegetables their complaints appeared about this unlucrative business.

Unfortunately, there are no exact figures of purchases and sales available during this period. According to the producer prices

one might assume that the enterprise must have had a good margin, in particular if taking into account the benefit of utilization of otherwise unused transport capacity. For the last two years "Kigezi Industries Ltd." claimed high losses in the vegetable business:

- 1958/59 a loss of shs. 22,083 .
- 1959/60 a loss of shs. 18,511.

In 1956 T.F. ELLIS introduced a system of grading connected with price differenciations. The same officer reorganized the entire vegetable production and succeeded in obtaining remarkable results in variety selection, in methods of production, in quality control as well as in organization of production. The products were bought with cash from the growers at the market places. It seems that the ease of obtaining cash contributed a lot to gaining the farmers' support who thus helped the scheme to overcome some very serious periods. Until the end of 1952 one lorry load of vegetables per week was sent to Kampala. From January 1953 onwards two markets per week were held, each filling one lorry.

- Monday: Muyumbu area
- Wednesday: Nyansha area.

Spare space was filled up with potatoes from Bubale area.

Table 46. Vegetables Bought by "Kigezi Industries Ltd." between 1951 and 1960

Year	Vegetable lb	Year	Vegetable lb
1951	54,208	1956	1,290,240
1952	465,920	1957	1,330,560
1953	585,536	1958	1,276,800
1954	547,232	1959	896,000
1955	846,720	1960	949,760

Source: UG.GOV.: District Files, Kigezi.

After buying, the vegetables were transported to Kigata, 4 miles Mbarara road[1] where hard vegetables were packed in sacks and soft vegetables in crates. Since the scheme started the growers have been complaining from time to time about the producer prices.

Table 47. Average Cash Income per Farmer and Week from Vegetable Sales, Beginning of 1952

Product	Average lb delivered per week	Producer Price sh/lb	Average Return per week sh.
Beetroot	5	0.07	0.35
Broad Bean	30	0.07	2.10
Cabbage White	30	0.03	0.90
Carrot	10	0.07	0.70
Cauliflower	40	0.08	3.20
Lettuce	30	0.07	2.10
Onion a)	5	0.30	1.50
Spring Onion	1/2 bunch	0.15	0.07
Turnip	5	0.04	0.20
Total Average Income per Week:			11.12

a) Onions were marketed outside the Vegetable Scheme mainly.

Source: UG.GOV.: District Files, Kigezi.

Table 48. Vegetable Producer Prices 1951 - 1960

Product	Producer Prices in sh/lb			
	1951	1953	1958	1960
Artichoke	-	-	0.05	0.05
Bean French	-	0.15	0.10	0.10
Beetroot	0.06	0.10	0.10	0.10
Broad Bean	0.07	0.08	0.10	0.10
Brussel Sprouts	-	0.25	0.40	0.40
Cabbage White	0.05	0.04	0.05	0.03
Carrot	0.07	0.08	0.15	0.07
Cauliflower	0.08	0.08	0.15	0.15
Celery	-	0.08	0.15	0.15
Cucumber	0.10	0.12	0.12	-

(cont'd)

1) At the Nicotine Factory of Kigezi Industries Ltd.

Table 48. (cont'd)

Product	Producer Prices in sh/lb			
	1951	1953	1958	1960
Leek	-	0.12	0.10	0.10
Lettuce a)	0.07	0.10	0.10	0.10
Onion	-	0.40	0.40	0.20
Parsley	-	-	0.25	0.15
Pea	-	0.30	0.40	0.30
Potato sol.	-	0.15	0.17	0.12
Swiss Chard	-	0.12	0.05	0.05
Tomato	-	-	0.30	0.30
Turnip	0.04	-	0.05	0.05

a) Price per head

Source: UG.GOV.: District Files, Kigezi.

The long distance to Kampala which consisted in those days of murram roads only complicated transport of this highly perishable commodity. Transport costs to Kampala were according to Kigezi Industries Ltd. 0.07 to 0.08 sh/lb in 1953. This figure has to be judged from the transporters' point of view whose aim it was to show high transport costs in order to ensure the Government's subsidy. Compared with the Kenya - Kampala transport costs on railway which amounted to 0.03 - 0.04 sh/lb, this was another handicap to the Kigezi vegetable production.

The District Agricultural Officer repeatedly questioned the commercial abilities at the marketing end. The following points have thereby to be taken into consideration:

- Kigezi Industries Ltd.'s main aim was to cover transport costs on the Kabale - Kampala route.
- Any extension of the vegetable business would have caused higher staff costs and more involvements to the firm, which were not considered profitable in regard to the comparatively low margin of this business.

- In order to gain and keep a share in the market of fresh vegetables a continuous supply is necessary. The growers in Kigezi did not seem to be prepared for this. The reason that the scheme was fairly popular with the producer is accounted for mainly by the weekly cash income derived from it.
- Set-up and management of the estates in Kenya and Congo were superior to the smallholding conditions of Kigezi. As they had more intelligence of up to the minute market conditions they often undercut the prices of the Kigezi management, who because of their lack of experience were not able to react quickly enough to the situation.

2. "KIGEZI DISTRICT GROWERS CO-OPERATIVE SOCIETY" 1961-1965

a. ESTABLISHMENT OF THE CO-OPERATIVE

The vegetable growers seem to have represented a certain group of the farming population from the beginning of the Vegetable Scheme. They might be categorized as the more open minded farmers responsive to modern production and organization methods.

Their co-operative endeavours go back to 1953. On January 10th 1953 the vegetable growers formed an interest group with the aim of getting registered as a co-operative society. At this meeting chairman, treasurer and secretary were elected. But the officials were not prepared to support this movement at the early stage, questioning whether the farmers would be ready to handle the matters of a co-operative for such a perishable commodity. It was stated that the eagerness of the farmers would be considered positively.

After Kigezi Industries Ltd. retired from vegetable marketing the Vegetable Co-operative, the first co-operative in Kigezi, was launched under the aid of the Department of

Co-operative Development on January 26th, 1961. Business was taken over from the private firm on March 1st, 1961. Headquarters remained on the premises of the former nicotine extracting factory in Kigata.

The situation was as follows: During their last year of operation Kigezi Industries Ltd. claimed to have lost sh. 18,500. The task shouldered by the new co-operative society, advised by the District Co-operative Officer and his two assistants was most difficult. Problems were caused by:

- the political and religious disapprovals of the members
- the high amount of sales by the growers to private traders
- the low quality standard of the vegetables produced
- lack of experience at the marketing end.

b. AREA OF PRODUCTION AND NUMBER OF VEGETABLE GROWERS

The vegetable producing areas remained about the same as before 1961. Farmers from Rubaya sub-county applied for membership, which had to be turned down as it would have made it necessary to start a new market off the main road. On February 27th, 1961 306 farmers were registered members of the co-operative society having paid the share of sh. 20 plus sh. 1 entrance fee.

Table 49. Development of the Number of Memberships in the "Kigezi District Growers Co-operative Society" 1961-65

Market	Sub-County	1961	1962	1964	1965 a)
Bubale	Bubale	5	12	135	181
Muyumbu	Kyanamira-Kabale	75	91	267	264
Kabanyonyi	Kyanamira-Maziba	36	68	151	162
Nyansha	Kyanamira-Maziba	42	72	190	190
Kyabugombe	Kyanamira-Maziba	103	151	271	281
Bukinda	Bukinda	24	89 b)	208	208
Rutobo	Bukinda-Kamwezi	21	-	139	145
Total c)		306	483	1,361	1,431

a) Membership August 1st, 1965 (foundation of Vegetable Union)
b) Inclusive Rutobo
c) Membership 1963 approx. 800 members.
Source: UG.GOV.: District Files, Kigezi.

c. **PRODUCTION**

Table 55 shows the development of the vegetable acreage. From July 1st, 1961 the co-operative society took over the ordering, buying, and distributing of seed. So far a fund had existed for "Intensification of Vegetable Cultivation in Kigezi" which enabled the Department of Agriculture to subsidise the seed supply. The Co-operative Officer was in charge of seed supply and distribution. He followed a pattern which aimed at overcoming the production of only a few vegetable kinds such as white cabbage and cauliflower. But this approach resulted in the farmers' dissatisfaction about the shortage of seed. The growers were asking to send a person to Kenya to study seed multiplication there in order to teach them to grow their own seed. The seed distribution system was another reason for complaints.

Table 50. Seed Distribution Quota 1962

Product	Weekly production required in lb	Average Yield per ounce in lb	Weekly seed for distribution in ounces
Beetroot	200	500	2 1/2
Brussel Sprout	1,600	500	1/3
Carrot	300	3,000	1/10
Cauliflower	3,000	5,000	1 2/3
Celery	4,000	4,500	1 1/8
Leek	300	200	2/3
Lettuce	1,000	800	3/4
Parsnip	300	200	2/3
Swiss Chard	150	500	3 1/2
Tomato	12,000	1,000	1
Turnip	450	450	1

Source: UG.GOV.: District Files, Kigezi.

The attempt to influence vegetable production by issuing certain amounts of seed according to probable demand and the insufficient distribution system increased demand for vegetable seed from outside sources. Private traders, owners of village shops, etc. were, of course, ready to deliver the

seeds the farmers could not obtain from the co-operative society. Still now, many shops are offering vegetable seed throughout the vegetable area. Vegetable varieties were only to a small extent chosen according to results collected from variety trials of the Department of Agriculture in Kachwekano. Seed was ordered from the catalogue list of the seed firms. The co-operative bought the seed in bulk from the seed supplier to pack it into small pakages for distribution to the vegetable growers.

Two Field Assistants who according to their own report managed to visit every individual farmer once every two months, were in charge of extension service in the Kigezi Vegetable Scheme. In 1964 an Agricultural Assistant was posted to be in charge of the scheme. The Agricultural Officer, Horticulture, of Uganda paid his first visit to the Kigezi Vegetable Scheme in 1963. He recommended concentrating vegetable production in blocks of about 20 - 25 acres in each of the most suitable swamps along the main road. Such blocks would help:

- extension service
- planting programmes for planned production
- introduction of rotation patterns
- reduction of theft
- application of modern cultivation methods.

In 1964 work started at the "Bubale Block Cultivation Scheme and Demonstration Market Garden" in an area of 12 acres in a swamp 4 miles from Kabale on the Kisoro road. The drained swamp was allocated to 30 farmers. The "Demonstration Market Garden" of 2 acres was to serve as the guideline for the owners of the plots. A general rotation was worked out based on:

- 3 cultivated fields
- 2 resting fields.

When this Block Cultivation Scheme was planned the development of the pH in newly drained swamps in South-Kigezi (see chapter C.1.b. Soils) was neglected. The farmers were asked to grow vegetables although vegetables did not do well in the demonstration area. In 1968/69 still only a few crops besides the pioneer plant, sweet potato, can be grown on an economic scale such as: local beans, potato sol., kohlrabi, strawberries, brussel sprouts, leek and cabbage.

d. DEMAND, PURCHASE, TRANSPORT AND SALES

Demand

The demand for vegetables in consumer centres like Kampala was mainly satisfied by supplies from Kenya. The reliability of the Kenya producers and not the quality caused wholesalers, retailers, and consumers to prefer Kenyan vegetables. The Kigezi co-operative society maintained its market mainly by providing vegetables during shortages of supply from Kenya, caused by drought etc. Towards the end of 1961 the Field Assistant in charge wrote: "The Society now is buying all the vegetables on credit and sells the seed also on credit. The manager of the Society tells us that not a single cent is in the bank. The vegetable work in Kampala is poor and difficult at present because there are plenty of vegetables there so Kigezi vegetables cannot be bought, while the growers of Kigezi think that they are bought and the money is stolen... If the Society keeps doing as they are doing now they will fail or be finished because they are not making enough good arrangements in their meetings and are interested only in political matters and religious sections...".

In June 1963 the Agricultural Officer, Horticulture in Uganda states: "... It seems the general opinion of the Co-operative Department that unles the Kigezi society can retain Central Government contracts it may be forced into liquidation. This

is no doubt a sensible view to take considering the states of the society's finances, but considering the quantities of vegetables being imported from Kenya for retail sale, I feel that a market other than Government contracts exists in Kampala into which the society could break, provided they can maintain a programme of regular supply throughout the year and operate from a properly organized depot in Kampala...". In the Annual Report of the Kigezi District Agricultural Officer for 1963 it is noted: "...During the year two lorries a week were transported to Kampala, but more than that could have been sent had there been greater demand for them...".

The project went on and the number of members increased from 306 in 1961 to 1,431 in 1965 (see table 49) which leads to the conclusion that the vegetable growing must have been an interesting cash source in spite of the difficulties encountered. 1964/65 was closed with shs. 3,557 loss (see table 87). Kenya dominated the Kampala market and Kigezi did not succeed in gaining outstanding shares of the market except the Central Government Tender. Table 89 gives the number of tenders supplied.

Vegetable Buying by the Society from the Farmers

The farmers brought their products at their given market day to the buying centre where the society manager together with the porters arrived on the lorry. The Field Assistant in charge was also present. The grading system and quality control introduced in 1956 must have been fallen into oblivion as the Agricultural Officer stated in 1963: "...Grading for vegetables was under consideration and as soon as good stores for the vegetable crops are available this sorting and grading will be organized...". The manager bought the products from each individual grower and paid cash. Vegetables which did not find space on the lorry were left behind (see table 51). Private traders used to pass the buying centres before the society lorry, in order to get hold of the better quality products and of vegetables which were in

short supply, which is another reason why the society's deliveries to Kampala consisted mainly of white cabbage, spinach, carrots, and potatoes.

The following table specifies the products bought which were either transported to Kampala or left behind at the buying centres.

Table 51. Vegetables bought by the Co-operative Society which were either transported to Kampala or left in Kigezi at the Buying Centres

Year	Month	Transported to Kampala (I) lb	Left at the Buying Centres (II) lb	(II) as % of (I)
1964	Aug.	122,138	7,476	6.1
	Sept.	119,825	35,310	29.5
	Oct.	100,957	25,329	25.1
	Nov.	107,507	30,168	28.1
	Dec.	113,816	37,550	32.9
1965[a]	Jan.	96,341	38,113	39.5
	Feb.	98,186	45,238	46.1
	March	144,867	40,374	27.9

a) As a result of reorganisation measures introduced by the newly appointed FAO advisor in April 1965 products bought by the manager were in general no longer left behind.

Source: UG.GOV.: District Files, Kigezi

Transport and Sales

Porters employed by the Kigezi District Growers Society handled the packing and loading of the vegetables. The packing materials in use were sacks for root vegetables and crates, made of a wooden frame interwoven by papyrus cord for soft vegetables. Between 1961 and 1965 two lorries left Kigezi every week with vegetables for Kampala. The cost for hired transport was shs. 500 per lorry from Kabale to Kampala.

As the rules of co-operative equality seemed to force the society to buy all vegetables delivered by the farmers it was

rather impossible to consider weekly fluctuations in demand at the marketing end. In addition, the communication and co-operation between the managers in Kigezi and Kampala was very poor. The extension staff tried to organize the production without any great success. The Agricultural Officer, Horticulture, concludes: "...This is the primary factor preventing progress in the industry in Uganda. The 800 small growers cannot be relied upon to produce a given quantity at a given time. In consequence the society loses customers of the vegetable retail shops who are forced to place their orders in Kenya... This problem cannot be overcome nor can any small farmer industry in such a perishable commodity succeed unless the effort is concentrated in reasonably large easily controlled areas...". Reasons given by the retailers why they prefer vegetable supplies from Kenya were:

- supplies from Kenya were more reliable
- whatever the order given is always met
- the vegetables arrive in time.

The question of quality was not of vital importance although in many cases Kigezi quality was even considered to be better.

3. THE "KIGEZI DISTRICT VEGETABLE GROWERS CO-OPERATIVE UNION LTD"

Already in 1962 the District Co-operative Officer suggested forming a District Union split into small societies, like the Ankole Coffee Union. In 1964 the Agricultural Officer, Horticulture, writes: "... The breakdown of the present society into seven separate societies based on present vegetable collecting centres should make future control easier...". Difficulties with election procedures and the opposition of members stopped this development for a long time.

In 1965 the Co-operative Officer of Kigezi together with the newly appointed FAO-OPEX Vegetable-Marketing-and Co-operative

Advisor, who took up work in Kigezi in March 1965, conducted the splitting up of the old society into seven Primary Vegetable Societies incorporated in the "Kigezi District Vegetable Growers Co-operative Union Ltd." which started operation on August 1st, 1965. Reasons and aims of the decentralisation were:

- As the vegetable growing area seemed to be too large for a central administration the responsibilities were localized into smaller units in regard to extension service, seed distribution connected with the regulation of production, purchase, grading and packing of the products.

- The buying of vegetables was shifted over from the manager to the Primary Societies. They bought directly from their members which reduced the time spent by the growers waiting for the manager and the lorry.

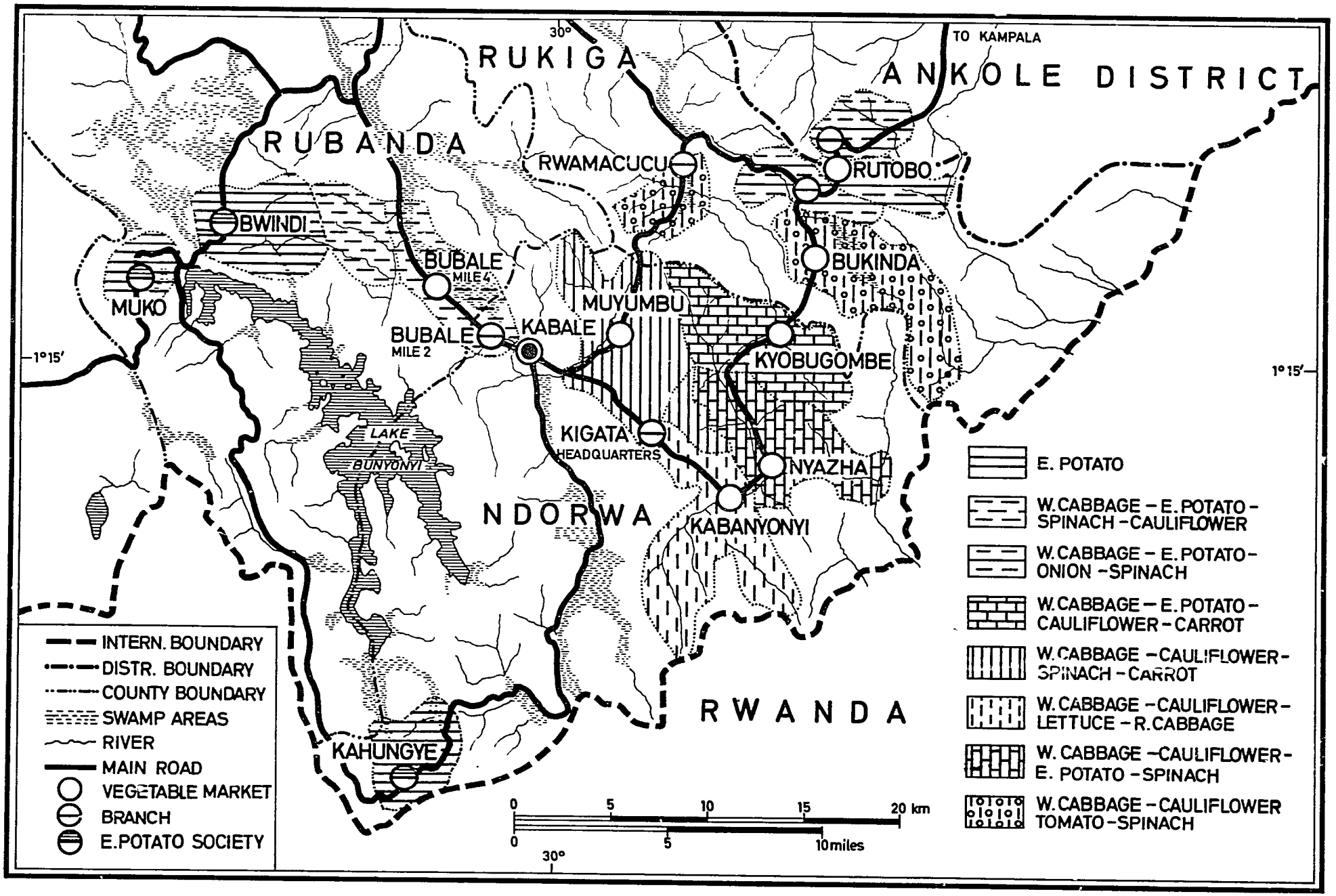
- As grading, weighing and packing were the responsibilities of the Primary Societies the buying procedure of the Union from the Primary Societies could be conducted in a relatively short time.

- Setting up of a double quality control:
  Farmer - Primary Society
  Primary Society - Union

- By the territorial delimination into areas the individual member has been given an understandable conception of how the co-operative is organised and he can influence the running of his Society by electing the person he knows and thinks suitable as a committee member. The possibility of accusing strange members from other areas of making mistakes etc. could be ruled out.

- It was easier to explain and teach the members the co-operative idea and the co-operative set-up through their own small society.

Map 5: Vegetable Producing Areas according to Primary Societies and main Kinds of Vegetable (1964 – 1966)



- Influences from outside could be better eliminated.

- Discovery and location of mistakes, difficulties and irregularities was easier, e.g. the particular Primary Society whose members caused overproduction of a certain commodity had to take the consequences in the form of buying restrictions imposed by the Union only, whereas the progressive Societies diversifying the vegetable production had not to share its profits with the others.

- Development of sound competition among the societies, possibilities of comparing expenses, progress and profits.

Table 52. Number of Market Days and Number of Vegetable Lorries leaving Kigezi per Week, 1965, 1967 and 1968

Primary Society	Market Days 1965	1967	1968
Bubale Mile 4 - 6	Wednesday	Wednesday	Wednesday
Bubale Mile 2			Thursday
Muyumbu	Wednesday	Wednesday	Wednesday
Kabanyomyi	Wednesday	Thursday	Thursday
Nyansha	Wednesday	Thursday	Monday
Kyobugombe	Monday	Monday	Monday
Bukinda	Monday	Monday	Tuesday
Rutobo	Monday	Thursday	Tuesday
Lorries per Week	2	3	4

Source: UG.GOV.: District Files, Kigezi.

Table 53. Number of Members of each Primary Society 1965 - 1968 (August)

Primary Society	1965	1966	1967	1968
Bubale	181	256	307	347
Muyumbu	264	303	350	357
Kabanyonyi	162	172	225	301
Nyansha	190	195	203	218
Kyobugombe	281	293	332	345
Bukinda a)	208	249	260	370
Rutobo	145	161	214	233
Kahungye b)	-	-	56	173
Bwindi b)	-	-	-	35
Muko (Kashenyi) b)	-	-	-	114
	1,431	1,629	1,947	2,493
Index	100	113.8	136.1	174.2

a) Including Rwamucucu

b) Associated Potato Co-operative Societies

Source: UG.GOV.: District Files, Kigezi.

Table 54. Vegetable Acreage within the Kigezi Vegetable Scheme 1961 - 1968

Year	Vegetable Acreage in acres
1961 a)	592
1962 a)	515
1963 a)	600
1964 b)	350
1965 b)	400
1966 b)	500
1967 b)	600
1968 b)	700 - 800

a) Estimates of the District Agricultural Office which appear rather high.

b) The author's estimates.

Source: UG.GOV.: District Files, Kigezi.

III. THE ORGANIZATION OF THE KIGEZI VEGETABLE SCHEME

1. THE VEGETABLE PRODUCTION

a. EXTENSION WORK

Compared with the Uganda average Kigezi is very well staffed in the field of agricultural extension work.

- Kigezi = 1 Adviser per 950 holdings
- Uganda = 1 Adviser per 2,000 holdings[1].

The Kigezi figure should be split up:

Project	Number of Extension Workers
Agriculture, general	50
Coffee production	15
Vegetable Scheme	8
Tobacco production	6
Tractor Hire Serive	2
Kachwekano District Farm Inst.	9
	91

After deducting the 41 extension workers engaged in special projects, 50 are left to general agriculture. Thus the proportion changes to 1 extension worker for 1,700 holdings.

Until 1965 two Field Assistants were advising the Vegetable Scheme. The Assistant Agricultural Officer who was in charge of building up the District Farm Institute in Kachwekano, in addition supervised the Vegetable Scheme, assisted by the Agricultural Officer, Horticulture, stationed near Kampala. In the co-operative sector the co-operative extension staff supervised the activities of the members. To revive and reorganize the struggling Vegetable Scheme the Uganda Government applied for a FAO Adviser who would be able to handle and advise the Scheme with regard to production co-operative work

1) UG.GOV.: Work for Progress, loc.cit., p.61.

and marketing. He took up his task as a FAO-OPAS Adviser in March 1965 and left the project in October 1968[1]. During this period the Scheme had:

- 1 Agricultural Officer (FAO)
- 1 Assistant Agricultural Officer
- 5 Field Assistants
- 1 Vegetable Instructor at the District Farm Institute.

The extension service in the Vegetable Scheme was based on the belief that in order to achieve rapid progress in agriculture the mass of the farmers and not a small elite group has to be approached. In practice it was found that a Field Assistant was able to visit an average of 125 farmers per month. Details are shown in table 55.

The number of farmers visited depends on the size of the area, the distribution of vegetable growers in the area, the site of the vegetable plots and the Field Assistant's travelling time. As vegetable growing in Kigezi needs weekly sowing and planting, the frequency of visits by the extension worker has to be relatively high. It was found that the maximum number of farmers per Field Assistant should be not more than 250 to 300, which was proved by the fact that the best results were achieved in the areas of the highest advisor/grower ratio.

Table 55. Time Spent in the Field by the Extension Staff per Month

Time during which the farmers can be visited: 9 a.m.-2 p.m.[a]	
Minimum time needed for adequate extension work per farmer:	
Average time needed to reach the next farmer:	5-10 min.
Greeting, etc.	5 min.
Teaching	15-30 min.
Total:	25-45 min.
Average:	35 min.

(cont'd)

1) FAO-OPAS: Food and Agriculture Organization of the United Nations, Operational Advisor integrated in the Civil Service of the Country assigned to.

Table 55. (cont'd)

Number of farmers visited per day:	7-12
Number of days available per Field Assistant per month:	
market days:	8
administrative days:	2
rainy days	2-4
sundays	4
Days left for work with the farmers in the field:	12-14
Number of farmers visited per month:	80-170
Average:	125

a) I.H. CLEAVE: "Food Consumption in Uganda", in East African Journal of Rural Development, Vol.No.1, Jan. 1968, Table 2, p.73.

Source: Compiled by the Kigezi Vegetable Scheme.

Table 56. Area and Number of Vegetable Growers per Field Assistant in the Kigezi Vegetable Scheme, 1968

Field Assistant	Area	Number of Growers
I	Kabale - Bubale	347
II	Muyumbu - Rwamucucu	438
III	Kabanyonyi	301
IV	Nyansha - Kyobugombe	563
V	Bukinda - Rutobo	522

Source: UG.GOV.: District Files, Kigezi.

b. METHODS OF EXTENSION SERVICE

General Situation of Extension Work in Agriculture in Kigezi

In the course of Africanization of the agricultural extension network starting in 1962, a number of transfers and reorganizations were necessary. This resulted in a marked decrease of the average time spent by a District Agricultural Officer at one duty station. In Kigezi the average was two years between 1934 and 1961, and

only one year between 1962 and 1969 (6 Agricultural Officers since Independence!). For the whole period 1934 to 1969 the average is 1.8 years per District Agricultural Officer[1]. The Ministry of Agriculture and Forestry envisages in the Second Five Year Plan a reorganization of extension services[2].

The following comments aim to give a picture of the situation stressing the disadvantages of particular points in practice to prevent these from becoming automatically accepted. Four matters within the set-up of the extension service experienced in Kigezi cause criticism:

- extension methods
- education and training of extension staff
- posting and transferring policy
- administration.

Extension Methods

The extension service is still dominated by the old system of pre-Independence administration. Modern methods are slowly being introduced with increasing number of younger staff. Some of the older generation of extension workers in all positions who had been educated and trained under the old system, have difficulties in adapting themselves to new methods. In the time of Protectorate administration attention was mainly paid to meetings, which were fixed by the District Administration and had to be attended by the people concerned. The officer gave his speech explaining the envisaged changes. When practicing this methods its fundamental disadvantages were overlooked:

- In many cases the governmental officer depended and still depends on an interpreter which increases the time of an already lengthy meeting.

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1) The average in Kenya was found to be 1 1/2 years. See H. RUTHENBERG: African Agricultural Production Development Policy in Kenya 1952-1965. Berlin 1966, p.28.

2) UG.GOV.: Work for Progress, loc.cit., p.62.

- The interpreter may not translate correctly, sometimes resulting in wrong information being given.

- The persons addressed at meetings are mainly men. The women who are generally conducting the daily field work hardly find time or opportunity to attend, as meetings are traditionally regarded as a matter for men. In regard to agricultural techniques the wrong part of the family is approached.

- At these meetings persons not directly related to agriculture such as traders, bar owners and the work-shy are taking a big share. Observations in Kigezi revealed that sometimes up to 25 to 50 per cent of the people present at meetings had nothing to do with the topic under discussion. But this group is already used to meetings and able to attract attention by asking elaborate questions. The really interested farmer however can hardly get a word in edgewise. Thus the officer is often given a completely wrong impression.

- As the percentages of illiterates among the rural population is still high experience shows that most of them are not able to listen attentively for more than ten minutes.

- It is also worthless to discuss several points as understanding is limited as well.

Meetings are absolutely justified as one of the many means of extension work. The method of conducting a meeting would be:

- short address
- the essential point has to be repeated at least thrice
- practical demonstrations to help the people to relax.

The number of people attending is neither an indication of the success of extension work nor a criterion of the population's interest. Large areas today are still not accessible by roads. The efforts of field walks of an average of 10 miles length were

undertaken by only a few officers. Seldom officers got their own hands dirty in demonstrations. The system of giving orders and directions was preferred. The results of investigations into the farmers' memories of agricultural staff revealed that only those officers were recalled who had practised field walks and besides their administrative activities had intensively engaged themselves in the field by demonstrating personally. Their instruction was the only advice remembered. As many of the African advisors had only the example of the expatriate officers, the methods of the latter were copied. Thus by many officers the following habits have been adopted:

- The tendency to hold meetings only. On the one hand it is much easier as the places can be reached by car and on the other hand giving speeches provides a certain feeling of importance.

- Many officers of the higher ranks are taking a dislike to field walks which they regard as too much to expect. As a result the areas not oponed up by roads are clearly neglected.

- Many Field Assistants are frequenting a certain route along the road where the superior officer is likely to pass with the car.

- On the whole progressive farmers are being given regular advice, whereas the ordinary farmer is regarded as not worth the effort.

- Most extension workers are preferring to wear a white shirt and good trousers when on duty and are very anxious not to dirty their hands during demonstrations[1].

The idea of influencing the general agricultural population with the assistance of the progressive farmers is, according to

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1) The Minister of Agriculture and Forestry criticises and battles against this attitude under the slogan: "Too many would be white collar workers."

BYAGAGAIRE[1] based on a certain misinterpretation and misunderstanding of the rural situation. This reasoning led to the introduction of the "Extension Saturation Project" in 1966. The policy speech of the Minister of Agriculture and Forestry explains: "...This project is an intensive effort by the Department of Agriculture to encourage and increase group activities in selected villages in order to influence our farmers to adopt better methods in agricultural production. This was to be achieved through result and method demonstrations, regular and frequent visits by departmental field staff to give advice "[2].

Education and Training of Extension Staff

However, the bad example of superiors does not only influence the efficiency of the persons engaged in extension work. A serious danger for agricultural advisors in particular lies in their schooling and professional education.

- Although the majority of the Uganda population comes from rural areas the long time spent in boarding schools leads to estrangement and dislike of practical work on farms.

- The professional education for all groups of extension staff has the character of a "study" and lacks practical experience.

- The extension workers find it difficult to carry themselves back into the world of mostly illiterate farmers.

- Very often difficulties occur in transforming the knowledge gained at school or university to the farmers' level of comprehension.

- Rural people discover very quickly the abilities or weak points of an advisor. In the latter case these observations result in the farmers' reserve and reticence towards the officer which

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1) J.M. BYAGAGAIRE: Some Notes on Agriculture in Kigezi. Unpublished 1962, p.2.

2) UG.GOV.: 1968/69 Policy Speech to Parliament Hon.J.B.T. KAKONGE M.P. Minister of Agriculture and Forestry, June 1968, Entebbe 1968, p.20.

usually does not escape the advisor's notice. The latter then tends to retire behind his administrative duties which are anyway too high[1].

Staff Posting and Transferring Policy

As already pointed out the average time spent by a District Agricultural Officer in Kigezi between 1962 and 1969 is one year. Successful agricultural extension work can only be based on a detailed knowledge of the area, of the seasons and of the rural population. The system of transfers, partly taken over from the time before 1962 negatively influences the success of extension work.

- It seems that higher authorities regard this transferring pattern as a means to demonstrate their power.
- The District Agricultural Officer who may be transferred at any time accordingly tends to apply this system to his subordinates. This was, e.g. one of the reasons that within the last three years each county in Kigezi had three Assistant Agricultural Officers in charge[2].

Under such circumstances successful and constructive extension work turns into a difficult task and this seems to be obviously one of the reasons for slow agricultural development. Observations reveal that for the moment progress and good results are mainly achieved in "Special Schemes" such as tea, coffee, tobacco or vegetables where specialized personnel concentrate on one group of growers. Extension workers in general agriculture, especially if their work is not controlled, represent the weakest link within agricultural administration. The efforts of reorganization of this sector will surely bear fruits.

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1) D.J. BRADFIELD: Guide to Extension Training, FAO Rome 1966, p.26.

2) UG.GOV.: District Files, Kigezi.

After the comments on the less exemplary among the agricultural extension staff the qualified, successful, and active officers have to be considered. They very seldom get the opportunity of following up and completing a project successfully. Normally at least three years are needed in agriculture to achieve any success:

- first year: getting acquainted with the situation
- second year: introduction of the programme
- third year: running of the project and following up of the results.

For a good officer his premature transfers must cause frustration and might stop him from getting too much involved in future tasks. The influence of local politicians and interested groups which an officer has to face should not be neglected. They will always try to get an officer transferred if he and the policy of the department collide with their ideas. Usually good officers encounter more difficulties and often more backing from his superiors would be required. The principle of frequent transfers seems to provide advantages to the less successful extension workers:

- as the efficiency of a person is difficult to judge
- as there is always the possibility of covering their own inefficiency by blaming their predecessor.

Regretfully when practising this transferring policy the fact has been neglected that experience and knowledge are valuable capital for the economic development of the country. Advisors should consider in their actions and proposals the traditional and customary conventions. People from abroad are mistakenly inclined to apply methods used in their home country unchanged to countries where they are supposed to help. As it is well known that hurry and precipitation among rural populations seldom bring positive results. An advisor should not expect results from particular people he is advising to be exceptional because he has only limited time available. Patience and endurance when advancing slowly step

by step are far more effective than an attempt to realize ambitious targets within a short period. Agricultural extension work is in most cases constructive work where no step should be undertaken before the previous one is understood by the farmers. In the case of vegetable production the steps taught were:

- selection of suitable sites for the vegetable plot
- introduction of proper seedbed work
- row planting
- introduction of new kinds and varieties
- rotation
- pest and disease control
- application of fertilizer.

Administration

WATT's findings in Kenya are also relevant to Uganda: the most important person within agricultural extension work, the District Agricultural Officer, spends three quarters of his time on administrative work and is lucky if he can find time once a month to drive through parts of his district and pay short visits to farmers and projects[1]. This situation indicates a waste of professional knowledge. Unburdening the District Agricultural Officer of his administrative obligations is necessary.

The Assistant Agricultural Officers in Kigezi are in charge of an average of 200 to 500 sq.miles. They already use one third of their time on administration. Furtheron their work is handicapped by lack of transport facilities and mileage allocation, which has an adverse effect on the necessary continuous contacts with practical work. The only link within the agricultural extension, continuously in touch with the farmers, is the group of Agricultural Assistants and Field Assistants. Unfortunately, they receive in many cases insufficient training and

1) E.R. WATTS: A Study of Agricultural Extension in the Embu District of Kenya Social Science Conference, 1966, University College, Nairobi, p.14.

are rarely acquainted with modern extension methods. Praxis shows that as in Kenya[1] more than three quarters of agricultural knowledge and innovations are imparted to the rural population by the least educated group within agricultural extension. To their training more attention should be paid by providing proper apprenticeships and refresher courses.

c. EXTENSION WORK WITHIN THE KIGEZI VEGETABLE SCHEME

The extension service in the Vegetable Scheme was based on the idea that in order to achieve rapid progress in agriculture the mass of farmers and not a small elite group has to be approached. The method is marked by the following points:

- The so-called "Baraza" (big meeting) is not to be given special significance.
- The main extension medium is the "field walk" during which a selected area e.g. a valley, is given advice each farmer being taught in his own fields[2].
- The farmer should neven be put under pressure.
- Each extension worker has to take his time to deal with questions and complaints of any farmer.
- Once or twice per year courses at the District Farm Institute are complementing the work done during the field walks.
- On the weekly market days farmers are given a further opportunity of approaching the field staff.
- A lot of time is being spent on training committee members.

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1) E.R. WATTS: A Study of Agricultural Extension in the Embu District of Kenya Social Science Conference, 1966, University College Nairobi, p.14.

2) A.T. MOSHER: loc.cit., p.129.

- The field staff is engaged in the field according to their background and abilities and they have not been transferred since 1966.

- Every farmer whether he is poor or rich, progressive or not will be paid attention. (Special care is taken of the weakest members.)

- The practical demonstration by the extension staff (with their own hands) is being carried out intensively[1].

Meetings

The annual general meetings of the Primary Societies are part of the co-operative work. Special informations are given during the weekly market days. Any other meetings are only held on request of the farmers. They are usually called to solve difficulties and problems concerning a group. If there are any decisions to be made during the meeting suggestions are given in advance and the date will be fixed in such a way that the farmers have enough time left to discuss the matter in small circles and make preliminary decisions beforehand.

Field Walks

The main extension medium is the field walk concentrating on a certain area, e.g. a valley. The farmers concerned are given notice early enough so that they have sufficient time to think over their questions and complaints. Each farmer is advised individually on his own field, with his own material, field, plants, etc. Mistakes can be more effectively shown, good examples and proposals better demonstrated. The fact that the governmental extension officers come to the vegetable plot of the individual grower to demonstrate there how to grow vegetables properly creates a far better starting platform for

1) A. BARYARUHA: Factors Affecting Industrial Employment. Nairobi 1967, p.48.

extension work than long talks held in meetings or in the governmental demonstration areas. Many of the poor illiterate farmers were thus approached for the first time. Consequently these farmers were often showing the best reaction to that kind of extension service by following methods demonstrated amazingly thoroughly and precisely. Their gratitude for the effort made for them and time spent by the advisor plays an important role.

A crucial factor in the success of this extension work is the presence of all family members, women and half-growns in particular, as they are usually carrying out most of the field work. Usually the growers who have received the advice accompany the advisor into the vegetable fields of the other farmers, taking the opportunity to examine carefully the work of neighbours and fellow members which would not be easily possible otherwise, creating a competitive atmosphere. As the advice given mostly deals with the same mistakes and problems the farmers moving with the extension staff get the opportunity of repeatedly hearing and watching. These field walks require much effort and strain on the part of the extension staff. The average distance covered per day amounts to 10 to 15 miles, the starting points are usually the roads. The continuous repetition of the main questions and advice demands patience and endurance. The educational standard of the average farmer makes it necessary for the officer to translate and transform his knowledge into the language and explanations they understand.

During the field walks committee members of the particular Primary Society always accompany the extension staff, thus gaining an impression and insight into the situation and the problems in their area. Difficulties faced by the farmers and their complaints, e.g. seed failures, flooding, diseases, etc. are dealt with on the spot where their importance can be judged. After the field walks the questions of the farmers not yet satisfied are discussed and answered, thus giving the impression that there is no intention to go around awkward problems.

The Field Trials

These field trials have the aim of getting the growers acquainted with new kinds and varieties. Seed or seedlings are provided by the Government. The farmer undertakes the cultivating and maintenance of the trial and is rewarded by the resulting yields. Planting is used for a practical demonstration in regard to soil preparation, spacing, row planting, etc. Later on the plot with its different kinds and varieties of vegetables serves as demonstration material for a selection of suitable varieties in the area, adequate cultivation methods, etc. Similarly fertilizer trials have been started recently. Within 1965/66 approximately 300 trials were planted throughout the area.

This form of demonstration within the farmers compounds is more convincing than demonstrations on governmental plots which easily evoke the grower's scepticism. For the Government this type of trial work is far more economical, e.g. the whole annual programme was carried out with a vote of shs. 1,000 (seed costs only). The results cover all climatic situations in an area and are obtained under real farm conditions.

The success proved that the farmers are open towards the introduction of new kinds or varieties, if they are given the opportunity beforehand of testing and gaining experience in their own or their neighbour's field. A good example was the comparison of cauliflower varieties. While in 1965 the farmers preferred a variety costing shs. 0.50 per packet, in 1968 all farmers insisted on receiving varieties for shs. 2.00 to 3.00 per packet and nobody bought any longer the old variety used in 1965.

Courses at the District Farm Institute

Whenever funds are available the Agricultural and Co-operative Department gives specialtraining courses for vegetable growers.

One particular topic is usually discussed during such a day, e.g. potato sol. production, fertilizer application, marketing problems, etc. Vegetable demonstration plots are maintained on the District Farm at Kachwekano which also serve as a vegetable supply for the courses held at the District Farm Institute. In this way the attending farmers get acquainted with methods of preparing different vegetable meals. One Vegetable Instructor is in charge of the vegetable demonstration plots and variety trials as well as teaching at the District Farm Institute.

Training of the Committee Members

Much time is being spent on teaching and training committee members of the Primary Societies and the Union. Main topics are questions concerning marketing problems and organization. It has to be noted that the performance of the leaders plays an important role in co-operative work. Some of the committee members who have to decide on production, transport, or sales of vegetables have never seen Kampala. This emphasizes the difficulties which have to be overcome. After a period of change and regeneration one might hope that the committee of the Union in particular will find a certain consolidation, so that the training of the present committee members can bear fruit and be intensified.

The Extension Staff within the Kigezi Vegetable Scheme

The crucial point of extension work within the Vegetable Scheme is a matter of personnel. The present method of extension work was completely new to the staff. At first the elder Field Assistants especially had some difficulties in summoning up the necessary patience when dealing with farmers in particular if they belonged to the poorer and less important group. To use their own hands during the practical demonstration was accepted only hesitantly. The conception of service, the most essential precondition of any governmental extension work, was accepted rather reluctantly. Because of the great strain put on them and the continuous control the staff within the Vegetable Scheme thought themselves in an un-

fair und handicapped position compared with their fellow extension workers in Kigezi. But now most of them feel proud of their achievements. This change of attitude and endeavours of the extension staff are the main reasons for the positive development of the Vegetable Scheme.

All Field Assistants appointed since 1965 had first to work at least one year as porter in one of the governmental demonstration areas. This system forced them to learn every type of work with their own hands. When posting the Field Assistants personal pre-conditions and abilities were co-ordinated with the situation of a particular area (Society). All extension work is based on merely convincing the farmer. He is never forced; it is up to his judgement and free decision which steps he thinks useful for himself[1]. The weakest and not the most progressive members get most attention. This stands in contrast to former practices.

Co-Operative Extension Service

The guideline of the co-operative extension work in the Vegetable Scheme is to practise order and conscientiousness[2] and to make the co-operative members aware of their rights and duties. The accounts of the Primary Societies and the Union are checked twice a year to disclose or follow up possible irregularities or mistakes General meetings are held at regular intervals giving the individual member the impression that in his particular co-operative affairs are running smoothly. Irregularities and questions in dispute are handled and clarified immediately and not indefinitely left for future enlightenment. The co-operative extension service in Kigezi is unfortunately understaffed so that supervisory duties have partly been taken over by the agricultural staff of the Vegetable Scheme.

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1) A.F. LAIDLAW: Training and Extension in the Co-operative Movement. Rome 1962, p.29.

2) ILO: Co-operative Management and Administration. Geneva 1963, p.23.

d. TESTS AND SELECTION OF VEGETABLE VARIETIES

In 1968 32 different kinds of vegetable were grown for marketing within the Vegetable Scheme. Between 1965 and 1968 there was an increase of 11 kinds (+ 52 %).

Table 57. Vegetable Varieties Marketed since 1951

Variety	1951	1958	1961	1965	1968
Artichoke		x	x	x	x
Bean French		x	x	x	x
Beetroot	x	x	x	x	x
Broad Bean	x	x	x	x	x
Broccoli				x	
Brussel Sprouts		x	x	x	x
Cabbage White	x	x	x	x	x
Cabbage Red					x
Carrot	x	x	x	x	x
Cauliflower	x	x	x	x	x
Celery		x	x	x	x
Capsicum				x	x
Cho-Cho	x				
Cucumber	x	x			
Doodo (Amaranthus)					x
Eggplant					x
Fennel					x
Kale					x
Kohlrabi					x
Leek		x	x	x	x
Lettuce	x	x	x	x	x
Marrow	x				x
Onion	x	x	x	x	x
Parsley					x
Parsnip		x	x	x	x
Pea		x	x	x	x
Potato sol.	x	x	x	x	x
Radish					x
Rhubarb				x	x
Spinach					x
Spring Onion	x				
Swedes	x				
Sweet Corn					x
Swiss Chard		x	x	x	x
Tomato		x	x	x	x
Turnip	x	x	x	x	x
	14	19	18	21	32

Source: UG.GOV.: District Files, Kigezi.

One of the criteria for successful vegetable production is the selection of suitable varieties. Except for a few selective trials on government experiment stations no systematical work in this field had been carried out. Basic investigations started in 1965 at Kachwekano District Farm for conditions on the hillside at 7,400 ft. in the Bubale swamp area established in 1964 for conditions in swamps at 5,900 ft. and with the field trials in the fields of the farmers. The results are shown in table 58.

Table 58. Results of Vegetable Variety Trials in South-Kigezi 1965 - 1967

Trials:

These results were obtained from simple trials (observation tests) in Kachwekano D.F.I., Bubale Swamp Area and Field Trials within farmers' plots throughout the vegetable producing area in Kigezi.

Seed:

Seed was used from the following seed resources:

Kirchhoffs East Africa Ltd. Nairobi, Kenya	= K
Lakhamshi Brothers Ltd. Nairobi, Kenya	= L
J.W. Newton, Murogosi Nurseries, Kenya	= N
Simpson and Whitelaw Ltd. Nairobi, Kenya	= S
Hurst seed over Lennox Brothers Ltd. Kampala	= H
Ohlsen, Denmark (seed samples)	= O
Burpee, USA (seed samples)	= B
German seed samples	= G

Recordings:

The results were summarized and rated on a simple scoring system including:

Crop development under South-Kigezi conditions: (G)
- 1 = Unsuitable for the area
- 2 = Fair growth
- 3 = Good growth

Pest and disease: (D)
- 1 = Heavy attacks
- 2 = Medium attacks
- 3 = Slight attacks

Marketing possibilities: (M)
1 = Poor (difficulties on the market)
2 = Medium (saleable but not outstanding)
3 = Good (asked by customers)

x) = Recommended by the Kigezi Vegetable Scheme.

Production period: (in weeks)

It includes the period between sowin date and first harvest date. Harvesting period from first to last harvesting date.

Remarks:

As a result of 2,255 tests with 291 varieties over a period of 3 years it can be noted that particularly in regard to East African seed suppliers a seed control system is urgently needed. Seeds of the same variety are greatly differing among the suppliers and among the deliveries from the same supplier. Results often showed that second grade seed are being distributed and nearly all kinds of seed born diseases were found. In order to protect the Kigezi vegetable growers a continuous control of all seed used by the Vegetable Scheme was found to be necessary.

Variety	Supp.	Tests	G.	D.	M.	Prod. Period	Harv. Period	Remarks
Artichoke:								
Large Green Globe	KLS	5	3	2	2	26-32	8-16	x
Purple Globe	KLS	4	2	2	1	28-32	8-16	
Remarks: Seed very unregular, badly selected, plants survive 3-4 years yielding two times per annum.								
Asparagus:								
M. Washington 500	K	2	2	2	2	60-64		
Remarks: Soil too heavy, not yet introduced to farmers.								
Broad Beans:								
Aquadulce	KS	10	3	2	3	10-12	3-5	x
Primo	K	3	2	1	2	10-12	3-4	
Threefold White	KS	3	2	1	2	10-12	3-5	
Conqueror Longpod	N	3	2	2	3	10-12	3-5	
Remarks: Heavy attacks of Uromyces fabae and Ascochyta fabae are common.								
French Beans:								
Abudance	K	8	2	2	2	8-10	3-5	
Black Wonder	K	7	3	2	3	8-10	3-5	x
Bountiful	B	3	1	1	1	10	4	
Brittlewax	K	10	2	2	1	8-10	3-5	
Canadian Wonder	KLN	6	2	2	2	8-10	3-5	
Contender	KN	8	3	2	3	8-10	3-5	x
Double Dutch Prin.	K	10	2	1	2	10-12	3-5	

Variety	Spp.	Tests	G.	D.	M.	Prod. Period	Harv. Period	Remarks
Dwarf Yellow	O	1	2	2	1	10	4	
Harvester	K	5	2	1	2	8 -10	3-5	
Haricot	S	3	2	2	2	10-12	3-5	
Hinrichs Riesen	G	2	2	2	2	8 -10	3-5	
Kinghorn Wax	K	10	2	2	1	8 -10	3-5	
Long Tom	KL	6	3	2	2	8 -10	3-5	
Masterpiece	KNS	15	3	2	2	8 -10	3-5	
Madagaskar Butter	N	2	2	2	1	10-12	4	
Pencil Pod Wax	K	6	2	2	1	8 -10	3-5	
Processor	KS	20	3	2	3	8 -10	3-5	x
Richmond Wonder	K	6	3	2	2	8 -10	3-5	
Seminole	K	5	2	1	2	8 -10	3-5	
Saxa	K	10	2	2	2	8 -10	3-5	
Stringless Greenpod	L	9	1	1	2	8 -10	3-5	
Tendergreen	K	10	2	2	2	8 -10	3-5	
Tenderlong	K	10	2	2	2	8 -10	3-5	
Top Crop	K	10	2	2	2	8 -10	3-5	

Remarks: Often badly selected seed, diseased. Many stringless varieties produce strings when ripe.

Runner Beans:								
Blue Lake Stringl.	K	6	3	2	2	8 -10	4-6	
Kentucky Wonder	K	3	2	2	2	10-12	4-6	
Lima Bush	KB	6	2	3	1	10-12	6-10	
Scarlet Wonder	N	1	1	1	1	12	10	

Remarks: French Beans are preferred on the market.

Beetroot:								
Crimson Globe	KNSL	25	3	2	3	10-15	6-8	x round
Cylindrica	K	12	3	3	1	9-12	4-8	long
Eclipse o.Detroit	K	10	2	2	3	10-15	6-8	round
Egyptian	KL	10	2	2	2	8-12	6-8	round
Extra Early Burpee	B	4	2	2	2	10-15	6-8	round
Detroit Dark Red	SL	4	2	2	3	10-15	4-8	round
Long Dark Red	N	5	3	2	1	10-15	4-8	long

Remarks: All Beetroot grow in Kigezi. Long types have no market.

Broccoli:								
Large Green Spr.	K	15	3	2	2	12-16	4-6	
Large White Mammoth	KL	2	2	2	1	16	4	
Sharpes Standard	N	1	2	2	1	20	4	

Remarks: Easy flowering, not yet introduced to farmers since very small market available.

Brussel Sprouts:								
Cambridge Late 5	S	4	3	2	1	30-34	12-16	
Cambridge Special	S	8	2	2	2	26-30	12-16	
Covent Garden	K	10	3	2	3	22-26	12-16	x
Evergreen	S	2	3	2	1	28-32	12-16	

Variety	Spp.	Tests	G.	D.	M.	Prod. Period	Harv. Period	Remarks	
Freezer No.207	S	6	2	1	1	26-28	12-16		
Full Basket	L	2	3	2	1	28	12-16		
Giant 1st and Best	S	1	2	2	2	28	12-16		
Half Dwarf impr.	SN	4	2	2	2	24-26	12-16		
Hamburger Market	K	20	3	2	2	20-24	12-16		
Jade Cross Hybrid	K	12	3	3	3	20-24	12-16	x	
Long Iceland	KSL	18	3	2	3	20-24	12-16	x	
Matchless	K	20	2	2	2	24-28	12-16		
Paris Market	K	15	2	2	2	28-30	12-16		
Semi Dwarf	N	4	2	2	1	24-28	12-16		

Remarks: Badly selected seed creates a continuous problem. Plants can yield for 2 to 3 years.

White Cabbage:								
Amager	G	3	2	2	2	22-26	3-5	small round
Brunswick	KL	5	2	2	2	22-26	4-6	medium flat
Christmas Drumhead	L	8	2	2	2	20-24	3-5	medium flat
Copenhagen Market	KL	22	2	2	3	18-22	3-6	small round
Cottwald Runner	L	6	2	2	1	20-24	3-5	small conical
Dwarf Flat Dutch	S	2	3	2	2	24-26	3-5	Large flat
Early Triumph	N	3	2	2	2	18-20	3-4	medium round
Eisenkopf	G	6	2	2	2	18-22	3-5	curled round
Golden Acre	N	4	2	2	2	18-22	3-4	small round
Glory of Enkhuizen	K	6	2	2	2	18-22	3-5	medium round
Greyhound	L	10	2	2	1	20-24	3-6	medium round
Jersey Wakefield	K	20	2	2	1	18-22	3-5	small conical
Maincrop	K	8	2	2	2	18-22	3-4	medium round
Mammoth	K	12	2	2	2	20-24	3-5	medium round
Prize Drumhead	KS	25	3	2	3	20-24	3-5	x large flat
Savoy Perfection	KS	15	2	2	2	18-22	3-6	curled round
Succession	K	12	2	2	2	20-24	3-4	medium flat
Sugar Loaf	KSL	8	2	2	1	18-20	3-4	small conical
Stonehead	L	7	2	2	2	20-24	4-6	medium round
Surehead	LS	6	2	2	2	18-20	3-5	medium flat
Whitham Wonder	L	4	2	2	1	20-24	3-5	small conical
Ulaincrop	L	5	2	2	2	20-24	3-4	small round

Remarks: All cabbage grows well in Kigezi.

Red Cabbage:								
Dauerrot	G	4	2	2	2	20-24	3-5	small round
Red Pickling	N	3	2	1	2	24-26	3-5	small round
Red Rock	KLS	18	3	2	2	20-24	3-5	x medium round

Remarks: Red Cabbage grows well but the market outlet is restricted.

Chinese Cabbage:								
Wong Bok	KL	4	2	2	1	16-20	1	flowers
Petsai	N	4	2	2	1	16-20	1	flowers

Remarks: Chinese Cabbage starts flowering before being ready.

Variety	Spp.	Tests	G.	D.	M.	Prod. Period	Harv. Period	Remarks
Capicsum (Green Pepper):								
California Wonder	K	10	2	2	2	30-34	12-24	
Chinese Giant	KL	5	2	2	2	26-30	8-20	
Early Calwonder	K	4	2	2	2	30-32	8-16	
Keystone Giant res.	K	12	2	2	2	28-32	12-24	x
Bull Nose	NSL	3	2	2	2	24-28	12-24	
Yolo Wonder	K	6	2	2	2	28-32	12-24	

Remarks: Capcsum grows in Kigezi, but the quality is not as good as in the tropical parts of Uganda.

Carrots:								
Amsterdam Forcing	K	10	2	2	2	12-18	3-6	long
Chantenay	KSL	5	2	2	2	12-16	4-6	half long
Half Long Nantes	BL	3	2	1	2	10-12	4-6	half long
Imperator	OK	10	2	2	2	14-20	3-4	long
Lange Rote Stumpfe	G	2	1	2	2	14-16	3-5	long
Marktgartner	G	4	2	2	2	14-16	3-5	half long
Nantes Half Long	N	4	2	2	2	12-15	4-6	half long
Nantes Improved	K	12	2	2	3	12-16	2-4	long
Oxheart	K	15	3	2	1	12-16	2-4	short
Royal Chantenay	K	20	3	2	3	12-16	2-4	x half long
St. Valery	SN	6	2	2	2	12-14	2-4	long
Touchon	K	15	3	2	2	14-18	2-4	long

Remarks: All carrots do well in Kigezi.

Cauliflower:								
Algier	L	8	2	2	2	20-24	3-4	high open
Automan Giant	L	10	3	2	2	22-26	3-4	high closed
Early Ital. Giant	KN	20	2	2	2	20-24	3-4	high open
Early London	N	2	1	2	1	24-26	3-4	high open
Extra Early 6 Wks.	KS	25	3	2	3	16-20	2-4	x low open
Frankfurter	G	2	2	2	2	24-26	2-4	high open
Gilt Edge	K	15	2	2	2	22-26	3-4	high open
Kibo Giant	K	15	2	2	2	20-24	3-4	high open
Non Plus Ultra	SL	8	2	2	1	22-26	2-3	high open
Patna Early	KS	4	1	1	1	-	-	flowers s.
Phenomenal Early	K	22	3	2	3	21-25	3-4	x high cl.
Primus	L	10	2	1	1	20-24	2-4	high open
Snow Giant	KL	9	2	2	2	16-20	4-6	low closed
Snowdrift	K	10	2	2	2	16-20	2-4	low open
Snowball	KLS	12	2	2	3	16-20	2-4	low closed
Southern Cross	K	9	2	2	2	20-24	3-4	low closed
Veitch Very Early	KS	11	1	1	2	22-24	3-5	high open

Remarks: Cauliflower grows very good in Kigezi.

Celery:								
Golden Self Blanch.	K	12	3	2	3	36-40	8-16	xlight green
Mammoth White	K	6	3	2	2	32-36	8-12	dark green

Variety	Spp.	Tests	G.	D.	M.	Prod. Period	Harv. Period	Remarks
Special Market Wh.	K	4	2	2	2	40-48	10-16	dark green
White Plume	K	2	1	1	1	-	-	failure
White Pascal	K	3	2	1	2	34-38	10-14	dark green

Remarks: During the wet season all celery is attacked by septoria apii.

Celriac:

Giant of Prague	KS	6	2	2	1	46-52	4-8	

Remarks: Up to now celriac roots grown in Kigezi are of low quality and need a long production time.

Chicory:

Brussels Witloof	K	5	2	2	2	32-36	1-3	
Magdeburg lg.rooted	K	3	2	2	1	32-36	1-3	
Improved	K	2	2	2	2	32-36	1-3	

Remarks: Chicory is not yet introduced to farmers due to technical problems (too heavy soil) and marketing problems.

Cress:

Curled Garden	K	3	3	2	1	4	1	
Plain	K	3	3	2	1	4	1	
Water	K	3	3	2	1	4	1	

Remarks: Cress does well but has no market and flowers early.

Cucumber:

Asheley	KN	4	2	1	2	12-16	2-4	x
Early Fortune	K	4	2	1	2	12-16	2-4	x
Marketer	L	2	1	1	2	12	2-4	
Palmetto	L	2	1	1	2	12	2-4	
Pickling	K	3	1	1	1	10-12	2-4	
Rhinish	K	3	1	1	1	1o-12	2-4	

Remarks: 12 more varieties were up to now tried without success. All types of leave disease restrict up to now cucumber production in most parts of South-Kigezi. (Especially Erysiphe cichoriacearum D.C. sclerotinia and fusarium.)

Eggplant:

Black Beauty	K	4	2	1	1	28-36	4-8	round
Early Round Purple	K	4	2	2	1	28-32	4-8	round
Early Long Purple	K	5	2	2	2	28-32	4-8	long
Florida High Bush	KS	6	2	2	3	28-32	4-8	long
Sadohara Long Purp.	K	3	2	1	2	30-36	4-8	long

Remarks: In most parts of South-Kigezi Eggplant production is limited due to climatic reasons.

Endive:

Endive Moss Curled	N	3	2	2	1	16-20	2-4	
Escarole	K	6	3	2	1	16-20	2-4	

Remarks: Endive has a limited market and flowers early.

Variety	Spp.	Tests	G.	D.	M.	Prod. Period	Harv. Period	Remarks
Fennel:								
Florence	KN	12	3	2	2	12-16	2-4	x
Fennel	SL	15	3	2	2	12-16	2-4	

Remarks: Fennel grows very well in Kigezi, the market is very limited.

Herbs:								
Sweet Basil	KN	5	2	2	?	16-20		flowers
Borage	KN	5	3	3	?	14-18		flowers
Caraway	KN	5	3	2	?	16-20		no flowers
Catmint	K	5	3	2	?	24-26		
Chives	KN	6	2	2	?	24-28		flowers
Coriander	KN	5	2	2	?	20-24		flowers
Dill	K	5	2	2	?	16-20		flowers
Lavendel	K	4	2	2	?	24-28		
Sweet Marjoram	KN	5	2	2	?	24-28		
Savoy Summer	K	5	2	2	?	24-28		

Remarks: Herbs do well in Kigezi, their market value has not yet been assessed.

Kale:								
Scotch Moss Curled	K	4	3	3	2	14-18	8-16	x curled
Dwarf Green	K	3	2	2	2	16-20	8-16	curled
Marrow Stem	N	2	3	2	1	20-24		fodder
Thousand Headed	K	3	3	3	1	20-24		fodder

Remarks: Kale does very well and yields a long period.

Kohlrabi:								
Purple Vienna	K	21	3	3	2	12-16	2-4	red
White Vienna	KN	24	3	3	3	12-16	2-4	x white

Remarks: Kohlrabi grows most successfully, but the market is restricted.

Leeks:								
Broad Flog	L	8	2	2	3	28-36	4-8	
Carentan	KN	12	2	2	2	28-36	4-8	
Elefant	G	3	3	2	2	30-36	4-8	
Italian Giant	K	11	3	2	3	28-34	4-8	x
Large American Flag	S	4	2	1	2	28-32	4-8	
Mussleburg Giant	KNS	9	2	2	3	28-34	4-8	
The Lyon	S	3	1	1	2	30-34	4-8	

Remarks: Leeks grow well, production time depends highly on season and soil fertility.

Lettuce:								
A 1	K	10	3	2	3	12-16	1-3	x
All the Year Rd.	KNL	4	1	2	1	12-16	1-3	no heads
Attraction	K	4	1	2	1	12-16	1-3	no heads
Golden City	K	20	2	2	2	12-16	1-3	x

Variety	Spp.	Tests	G.	D.	M.	Prod. Period	Harv. Period	Remarks
Great Lakes	KS	21	3	2	3	12-16	1-3	x
Iceberg	K	19	1	2	1	12-16	1-3	
London White Cos.	K	9	2	2	1	14-18	1-3	no heads
Mammoth Butter	K	7	1	1	1	12-16	1-3	no heads
Mayking	K	13	1	2	1	12-16	1-3	no heads
New York impr.	KS	17	2	2	2	12-16	1-3	
Paris Cos	KN	5	2	2	1	12-16	1-3	
Tennis Ball	N	3	1	1	1	12-16	1-3	no heads
Webbs wonderful	KS	23	3	2	3	14-18	1-3	x

Remarks: Lettuce grows well but the seed is often badly selected.

Onion:

Bombay Red	KNS	4	2	1	2	28-36	1-4	red
Burgundy Red	K	11	2	2	3	28-34	1-4	red
Egyptian Flat	K	5	2	2	1	28-26	1-4	yellow
Red Creole	KS	18	3	2	3	26-34	1-4	x red
Red Creole Tr.Hyb.	K	11	3	2	2	28-34	1-4	red
Texas Grano	KS	12	3	2	1	28-34	1-4	yellow
Silver King	K	7	3	2	1	24-32	1-3	white
Early Cape Flat	NS	5	2	2	1	26-34	1-4	yellow
White Creole	K	4	2	2	1	26-36	1-3	white
White Mexican	K	4	2	2	1	26-36	1-3	white
Yellow Bermuda	KL	5	2	2	1	28-36	1-4	yellow
Yellow Creole	K	7	2	2	1	27-33	1-4	yellow

Remarks: Onion production in South-Kigezi depends on the climatic conditions and the season. Yellow and white onions have no market demand in Uganda.

Parsley:

Champion Moss Curled	K	21	3	3	3	10-14	every month	x
Green Curled	N	11	3	2	2	10-14	every month	
Plain	K	4	2	2	1	10-14	every month	

Remarks: Parsley does very well, harvesting period over one year
Only disease: Sclerotinia sclerotiorum.

Parsnip:

Guernsey	KS	5	2	2	2	20-24	2-6	
Harris Model	K	6	2	2	3	20-24	2-6	
Hollow Crown	KS	5	3	3	3	18-22	2-6	x
Intermediate	N	2	2	2	2	20-24	2-6	

Remarks: The main problem with Parsnip is the germination of the seed.

Peas:

Aldermann	KS	16	2	2	3	10-12	4	high
Black Eyed Suzanne	K	8	3	2	1	12-14	4	high
Eminent	K	18	2	2	2	8-10	2-4	low
Greenfast	KNS	17	3	2	3	9-11	3-4	x medium
Grey Sugar	H	4	3	2	2	10-12	4	medium
Kelvedon Wonder	KN	7	2	2	3	10-12	4	high
Kl.Rheinländerin	G	2	2	2	2	8-10	2-4	low

Variety	Spp.	Tests	G.	D.	M.	Prod. Period	Harv. Period	Remarks
Mammoth Luscious	K	10	3	3	2	12-14	3-5	high
Marrow Fat	N	2	2	1	2	10-12	2-4	low
Meteor	K	4	1	1	2	10-12	3-5	medium
Onward	KS	11	2	1	2	12-14	3-5	high
Pee Wee	N	2	2	2	1	8-10	2-4	low
Sugar	O	2	2	2	3	10-12	2-4	medium
Strategane	K	6	1	1	3	12-14	2-4	low
Telephone	K	7	2	2	2	10-12	3-5	high

Remarks: Peas do well but birds attack badly and seasonal planting restricts production.

Potatoes:

Ambassadeum	Kawanda	3	2	1	2	10	1	blight
Cineke	Kawanda	3	2	1	2	10	1	blight
Furore	Kawanda	3	2	1	2	10	1	blight
Pimpernel	Kawanda	4	2	1	2	10-14	1	blight
Prof.Brokema	Kawanda	4	2	1	2	10-14	1	blight
Roslin Eburu	Kachwek.	11	3	3	3	10-12	1	x resistant
Seed Potatoes	Kawanda	15	1	1	2	12-16	1	blight
Susanna	Kawanda	5	3	1	3	10-14	1	blight

Remarks: Up to now only one variety proved phytophthora infestans resistant. It has two months dormancy, yields 4 ton/acre.

Radish:

Cherry Belle	K	12	3	2	3	4	1-3	x red
Early Scarlet Turn.	K	4	2	2	2	4	1-4	red round
French Breakfeast	KL	8	2	2	2	4	1-3	red-white
Giant Globe	K	8	2	2	2	4	1-3	red-round
Mooli Long White	KL	7	3	2	1	6	2-4	white long
Non Plus Ultra	S	7	2	2	2	4-6	1-3	red round
Round Black Span.	S	5	3	2	1	8-10	2-4	black round
Sparkler	K	10	2	2	2	4	1-3	red-white
White Icicle	KS	21	3	2	3	4-6	1-4	x wh.long

Remarks: Radish grow well, some get easy stringy.

Rhubarb:

Victoria	KS	8	2	2	2	28-32	twice/year	x
Royal Albert	N	3	2	1	2	30-34	twice/year	

Remarks: Grows not well in all areas and is heavily attacked by insects.

Spinach:

King of Denmark	K	4	2	1	2	8-10	1-2
Matador Giant	KG	6	1	1	1	8-10	1-2
Monstrous Viroflay	K	5	1	1	2	8-10	1-2
New Zealand	KN	7	3	3	2	10-14	continuous

Remarks: Heavily attacked by Peronospora spinaciae.

Variety	Spp.	Tests	G.	D.	M.	Prod. Period	Harv. Period	Remarks
Swiss Chard:								
Fordhook Giant	KN	23	3	3	3	10-14	over 1 yr.	x
Lucullus	KNS	25	3	2	2	10-14	over 1 yr.	
Perpetual	N	9	2	1	1	8-12	12-40	
Squash:								
Zucchino	K	2	2	1	1	12	3-4	
Courgette	K	2	2	1	1	12	3-4	
Sweet Corn:								
Early King Hybrid	K	4	2	1	2	10-12	1-3	
Golden Bantam	K	4	2	1	2	10-12	1-3	
Stowells Evergr.	KS	8	2	2	2	12-16	1-3	x
Sugar King Hybrid	K	5	2	1	2	10-12	1-3	
Tomatoes:								
Alisa Craig	K	18	3	2	2	20-24	8-12	small
Amateur	K	8	2	2	2	18-22	8-12	bush small
Beauty	K	7	2	1	1	20-24	8-10	large
Best of All	KL	9	2	2	2	24-28	8-14	medium
Break of Day	KLS	6	2	2	2	24-26	8-12	large
Golden City	K	2	2	2	1	24-28	10-16	medium
Golden Queen	K	4	2	2	2	24-28	8-12	medium
Hellfrucht	G	3	2	2	2	20-24	8-12	medium
Hortus	K	15	2	2	3	22-26	8-14	x medium
Hundred Folded	SN	3	2	2	2	24-28	8-10	medium
Large Red	N	7	2	1	1	28-32	8-12	large
Marglobe	K	17	2	1	2	24-28	8-12	med/large
Moneymaker	KS	23	3	2	3	20-24	8-12	xmed/small
New Texas Wonder	K	9	2	2	2	28-32	8-12	large
Oxheart	K	13	2	1	1	22-26	8-12	large
Pearson	KLS	10	2	2	2	26-30	8-12	med/large
Penderosa	K	6	3	2	2	24-28	8-12	medium
Red Cherry	N	2	2	2	1	24-28	8-12	lg/small
Roma	K	9	3	2	1	20-24	10-14	lg/medium
Rutgers	KLS	21	2	2	3	24-28	10-16	x medium
San Marzano	K	8	2	1	1	22-26	8-12	large
Southland	K	5	2	2	1	20-24	10-14	large
Sunrise	NS	3	2	2	2	22-26	8-12	medium
Supermarmade	K	7	2	1	1	24-28	8-12	large
Supreme Perfect.	KL	9	3	2	2	24-28	8-12	large
Ushana	KL	5	2	2	2	22-26	8-12	medium
Valiant	K	9	2	2	1	24-28	8-12	medium

Remarks: Swiss chard grows very well in South-Kigezi.

Remarks: Too cold and humid for a successful production.

Remarks: Sweet corn seed is heavily infected by diseases.

Remarks: Tomatoes grow well in Kigezi only during the wet season a continuous disease control against phythophthora infestans is necessary for a successful production.

Variety	Spp.	Tests	G.	D.	M.	Prod. Period	Harv. Period	Remarks
Turnips:								
Americ.Purple Top	N	2	1	2	2	10-14	2-4	red/white
Champion	K	8	2	2	2	12-14	4-6	white
Early Flat Red Milan	S	3	1	1	2	10-12	2-4	red/white
Early Snowball	KS	16	2	2	3	8-10	2-6	x white
Early Wh.Purp.Top	NS	6	2	2	2	8-12	2-6	white/red
Just Right Hybrid	K	12	3	2	3	6-10	2-4	x white
Red Top Wh.Globe	K	5	2	2	2	12-16	2-6	white/red
Rutabaga Gard.Sw.	KS	10	3	3	1	12-16	4-8	yellow
Sweet Turnip	K	4	3	2	2	8-12	2-4	yellow
Yell.Golden Ball	KN	7	3	2	1	8-12	2-6	yellow

Remarks: Turnips do well in South-Kigezi. Yellow varieties have no market.

Fruits:							
Strawberries							
Cambridge Favorites		3	3	2	10-14	twice/year	x
Strawberries local	6	3	2	1	10-14	twice/year	
Passion Fruit	2	2	2	2	52-60		
Mountain Paw paw	3	3	2	3	50-60	continuous	
Tree Tomato	4	2	2	2	50-60		
Cape Gooseberries	4	3	2	1	36-40		

Remarks: Strawberries production time from transplanting to harvest. All other fruits from seed. Most fruits lack enough sugar content under South-Kigezi conditions.

Table 59. Kinds of Vegetable Grown within the Kigezi Vegetable Scheme and the Recommended Varieties 1966 and 1968

Kind	Vegetable Varieties 1966	1968
Artichoke	Large Green Globe	Large Green Globe
Bean French	Processor	Processor, Contender
		Richmond Wonder
Beetroot	Crimson Globe	Crimson Globe
		Cylindrica
Broad Bean	Aquadulce	Aquadulce
Brussel Sprouts	Long Iceland	Covent Garden
	Covent Garden	Jade Cross Hybrid
Cabbage White	Prize Drumhead	Prize Drumhead
		Savoy Perfection
		Copenhagen Market
Cabbage Red	Red Rock	Red Rock
Carrot	Chantenay	Royal Chantenay
Cauliflower	Early Six Weeks	Early Six Weeks
		Phenomenal Early
Celery	Golden Self Blanching	Golden Self Blanching
Capsicum	Keystone Giant Resist.	California Wonder
		Keystone Giant Resist.
Cucumber	Ashley	Palomar
Eggplant	Florida High Bush	Florida High Bush
Fennel	Florence	Florence
Kale	-	Scotch Moss curled
Kohlrabi	White Vienna	White Vienna
	Purple Vienna	Purple Vienna
Leek	Italian Giant	Italian Giant
Lettuce	Great Lakes	A I
	New York improved	Webbs Wonderful
Onion	Red Creole	Red Creole
	Texas Grano	Texas Grano
	Silver King	Silver King
Parsley	-	Champion Moss Curled
Parsnip	Harris Model	Guernsey
Pea	Greenfeast	Greenfeast, Onward
Potato sol.	-	Roslin Eburu
Radish	White Icicle	White Icicle
	Cherry Belle	Cherry Belle
Rhubarb	Victoria	Victoria
Spinach	-	Monsterous Viroflay
Sweet Corn	Stowells Evergreen	Stowells Evergreen
Swiss Chard	Lucullus	Fordhook Giant
Tomato	Hortus	Moneymaker
	Marglobe	Rutgers, Alisa Craig
Turnip	Snowball	Just Right Hybrid

Source: UG.GOV.: District Files, Kigezi.

e. ORDERING AND DISTRIBUTION OF SEED

Seed Supply

Seed of varieties which proved suitable for the conditions in South-Kigezi are bought by the Vegetable Union in bulk from seed firms in East Africa. The Union puts the seed in small packets for sale to the members of the Primary Societies. In order to avoid the tiresome and slow procedure of weighing, the following measures are implemented:

- One tablespoon for seeds such as celery, carrot, cabbage
- One handful for seed as sweetcorn, bean, pea, etc.

The vegetable production is often hampered by low germination rates, seed borne diseases or low varietal purity and authenticity. Therefore, the Department of Agriculture sows a control sample of each new consignment in its experimental plots which enables the extension staff to judge possible complaints of the farmers. At the same time the person in charge of the packing and distribution of seed conducts germination tests of fresh seed by distributing 100 seeds between damp blotting paper.

Seed Distribution

The Kigezi Vegetable Union hands over the seed packets for distribution during the following week to the committee members concerned at each Primary Society and market day. The number of seed packets allotted depends on:

- the estimated vegetable demand in the market
- the number of members in each Primary Society
- the specific microclimatical conditions of the growing area.

Table 60. Seed Packets Distributed to the Primary Societies per Week (July 1968)

Kind	Number of Packets for each Primary Society a)								
	Total	Bub.	Muy.	Kab.	Nya.	Kyo.	Buk.	Rwa. b)	Rut.
Artichoke	20	4	2	2	2	2	2	4	2
Bean French	64	12	8	8	8	8	8	4	8
Beetroot	100	20	12	12	12	12	12	8	12
Broad Bean	50	9	7	6	6	7	7	2	6
Bruss.Sprouts	78	18	10	8	8	10	8	8	8
Cabbage White	130	26	20	16	16	20	18	-	14
Cabbage Red	8	2	1	1	1	1	1	-	1
Carrot	190	40	25	25	25	25	25	5	20
Cauliflower	162	28	24	26	18	26	26	8	16
Capsicum	36	8	4	4	4	4	4	4	4
Celery	45	10	5	5	5	5	5	5	5
Cucumber	28	-	1	-	-	1	6	10	10
Eggplant	32	1	-	-	-	1	8	10	12
Fennel	6	1	1	1	-	1	1	-	1
Kale	4	1	1	-	-	1	1	-	-
Kohlrabi	6	1	1	1	-	1	1	-	1
Leek	55	11	8	8	5	8	6	5	4
Lettuce	81	12	12	12	10	12	12	3	8
Onion	205	6	3	3	3	30	65	30	65
Parsley	18	4	2	2	2	2	2	2	2
Parsnip	54	12	6	6	6	6	6	6	6
Pea	90	20	10	10	10	10	10	10	10
Radish	18	4	2	2	2	2	2	2	2
Rhubarb	22	6	2	2	2	2	2	4	2
Spinach	7	1	1	1	1	1	1	-	1
Sweet Corn	18	4	2	2	2	2	2	2	2
Swiss Chard	86	16	12	12	10	12	10	4	10
Tomato	35	2	1	5	1	2	10	4	10
Turnips	78	16	10	10	10	10	10	2	10
Marrow	8	-	-	-	-	-	2	2	4
Okra	15	-	-	-	-	-	3	6	6

a) Bub. = Bubale Mile 2, 4, 6; Muy. = Muyumbu; Kab. = Kabanyonyi; Nya. = Nyansha; Kyo. = Kyobugombe; Buk. = Bukinda; Rwa. = Rwamucucu; Rut. = Rutobo.

b) Rwamucucu is a branch of Bukinda Primary Society.

Source: UG.GOV.: District Files, Kigezi.

This attempt to regulate vegetable production according to the estimated demand encounters difficulties:

- Farmers like to store the seeds in order to use them at times when cultivation is easier and safer.
- Lack of interest in succession planting and production.
- Seeds of vegetables whose distribution rate is purposely kept low by the Union to avoid overproduction are bought from outside sources.

The Kigezi District Vegetable Growers Co-operative Union does not intend to profit from seed distribution. The prices are just high enough to cover the costs of seed, transport, envelopes and packing. Thus the Union offers the cheapest seed in the whole district.

The introduction of new vegetable varieties with higher seed costs caused difficulties at first. The farmers were not willing to spend more money on this seed especially since these varieties often did not achieve higher producer prices. Therefore, the Union started to offer this seed below prime cost in order to stimulate production of rare varieties in order to serve every possible demand at the marketing end. Jointly the seed prices of vegetable kinds likely to be in overproduction such as carrot, cabbage, etc. were slightly increased subsidizing the introduction of new types of vegetables.

Table 61. Value of Seed Sold to the Farmers by the Vegetable Union and Average Value of Seed Purchases per Farmer

Year	Value of Seeds Sold Shs	Average Value of Seeds Purchased per Farmer Shs
1961/62	2,482.20	8.10
1962/63	4,160.60	8.60
1964/65	12,306.50	8.60
1965/66	10,095.25	6.20
1966/67	15,553.90	8.20
1967/68	24,407.70	11.25

Source: UG.GOV.: District Files, Kigezi.

In addition it is estimated that the seed bought from shops and other sources in 1967/68 amounted to approximately 20 per cent of the seed sold by the Vegetable Union.

Table 62. Average Number of Seeds per Seed Packet and Price per Seed Packet

Variety	Number of Seeds/Packet	Price per Packet (Shs)
Artichoke	130	0.40
Bean French	360	0.60
Broad Bean	30	0.60
Bruss.Sprouts	1,300	0.40
Cabbage White	1,000	0.30
Cabbage Red	1,100	0.40
Carrot	3,500	0.30
Cauliflower	1,450	2.00-3.00
Capsicum	580	0.40
Celery	7,400	0.40
Cucumber	170	0.30
Eggplant	820	0.40
Fennel	350	0.30
Kale	1,500	0.30
Kohlrabi	1,200	0.30
Leek	1,300	0.40
Lettuce	2,350	0.30
Marrow	120	0.40
Onion	1,040	0.40
Parsley	2,250	0.30
Parsnip	600	0.20
Pea	340	0.60
Radish	530	0.20
Rhubarb	40	0.40
Spinach	180	0.30
Sweet Corn	410	0.60
Swiss Chard	180	0.30
Tomato	700	0.60
Turnip	1,700	0.20
Beetroot	135	0.20
Okra	80	0.30

Source: UG.GOV.: District Files, Kigezi, and author's counting.

f. SITE SELECTION FOR VEGETABLE FIELDS

According to season a certain movement of the site of vegetable fields can be noticed:

- dry season: close to swamps and rivers
- rainy season: along the hills.

Preconditions for the site of a vegetable plot are:

- proximity to water
- proximity to house
- soil fertility
- climatic conditions
- transport situation

Availability of water is the essential factor for vegetable production during the dry seasons, January-February, and June-August. Flooding of swamps sometimes occurs during rainy seasons rendering production impossible there. The continuous rains then enable the growers to produce along the hillsides. The necessary intensive cultivation measures and the possibility of field thefts make the farmers choose plots for vegetable growing close to their homes.

As vegetables serve as a source of cash income the farmers pay high attention to soil fertility when selecting the site of the vegetable plot, preferring valley bottoms, swamp edges and fields after fallow. The extension service advises checking the fertility of a field by the indicator plants sorghum or maize. Sorghum in particular gives good comparing possibilities as it is widely grown. The differences of soil fertility within a field are sometimes remarkable, especially in the hilly parts of South-Kigezi and farmers are taught to observe areas within a field where e.g. sorghum is growing best and to plant the vegetable beds there. Whereas some areas are unsuitable for the production of certain vegetables,

e.g. cauliflower because of lack in micro-elements, other parts offer optimal pre-conditions for certain vegetable kinds (cauliflower valleys). Growing of vegetables which proved to do best in a certain area is being sponsored there.

Differences in climatical pre-conditions within South-Kigezi necessitate differentiation of vegetable kinds according to required mean temperature[1] or susceptability to pests and diseases (see map 5). The banana is used as an indicator plant for vegetables requiring a higher mean temperature such as tomato, cucumer, eggplant, onion, marrow, okra, etc. During rainy seasons farmers are advised to produce vegetables such as tomato, carrot, bean, etc. which would suffer from disease attacks in the valleys with their prevailing mists and high humidity, on the hill tops where prevalent winds guarantee quick drying.

The site of the field and its distance to the market is an essential factor affecting transport costs considerably. Growers are told to plant heavy bulky products, e.g. cabbage on plots closer to the market and to grow light, high priced kinds, e.g. Brussel sprouts on more distant fields. Here as well the extension staff tries first to exploit all expense saving measures increasing yields and income without additional costs.

g. **CROP ROTATION**

In general vegetables are proceeded by one or two crops improving the soil after fallow.

- In swamps and swampy areas mainly Sweet Potatoes.
- On the hillsides mainly Peas or Sweet Potatoes.

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1) H.F. WINTERS: Vegetable Gardening in the Caribbean Area. Agricultural Handbook No. 323, US Department of Agriculture, Washington D.C., 1967, p.5.

To counteract dangers of vegetable monoculture the following simplified rotation system was introduced:

Table 63. Simplified Vegetable Rotation Pattern

Group	Types of Vegetable
1	Vegetables with big leaves, e.g. Cabbage, Cauliflower, Brussel Sprouts, etc. (Brassicaceae)
2	Vegetables with roots, e.g. Carrot, Beetroot, etc.
3	Vegetables with small leaves, e.g. Celery, Tomato, Potato, Onion, etc.
4	Leguminous vegetables, e.g. Pea, Beans, etc.

Source: Vegetable Guide for the Kigezi Vegetable Scheme (in Rukiga).

Any simplification involves dangers, of course, but in practice a simple pattern has to be given preference taking into account the educational standard of the farmers. Complicated, scientifically well founded rotation systems caused only confusion and have not been followed.

Table 64. Plot Division According to the Simplified Vegetable Rotation Pattern for Kigezi

	Plot I	Plot II	Plot III	Plot IV
1st year	Group 4	Group 1	Group 2	Group 3
2nd year	Group 3	Group 4	Group 1	Group 2
3rd year	Group 2	Group 3	Group 4	Group 1

h. **SEEDBED**

The following factors are stressed when demonstrating seedbed work to the farmers[1];

- concentration of all seedbeds at one place
- proximity to the house
- water availability
- soil fertility applying of manure and compost
- shade
- sowing in rows
- right spacing.

Until 1965 growers used to lay out seedbeds in different fields mostly aiming, consciously or not at decreasing risks. Often the content of one seed packet was just put into the soil without attempting to follow any system, rule or cultivation method. During the last three years special attention was paid by the field staff to proper seedbed work. Proximity to home and water as well as soil fertility are now general practice[2]. Some of the more progressive growers use compost[3], approximately 15 per cent[4]. A seedbed is usually 1 yd. wide and equipped with a shelter. The rows are marked by a straight stick. The proper planting depth is recommended in relation to the size of the seeds. For spacing, measurement aids like finger, hand and foot are applied (see table 69). Within the

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1) W.H. TURNBULL: How to Grow Vegetables, London, 1951, p.13.
A.V. and V.L. GIBBERD: A Gardening Notebook for the Tropics, London 1959, p.56.
H.F. MACMILLAN: Tropical Planting and Gardening, London 1962, p.278.
A.J. JEX-BLAKE: Gardening in East Africa, London 1957, p.324.
J.C. TEMPLER: Horticultural Handbook, Vol.I, Nairobi 1966, 57
H.D. TINDALL: Fruits and Vegetables in W.Africa, Rome 1965, 26
H.F. WINTERS: Vegetable Gardening in the Caribbean Area,loc.cit

2) UG.GOV.: Agricultural Production Progr., Entebbe 1967, p.31

3) Usually household garbage.

4) The author's investigations.

seedbed the general row spacing is one hand's width. About 10 to 20 per cent of the members own watering cans which can be obtained in a limited number subsidized by the Department of Agriculture. Different other types of containers are in use as well. Good maintenance, especially weeding, is being emphasized by the field staff. To avoid pests and diseases becoming established in the seedbed the growers are advised to change the site of the seedbed after two years.

At present the Department is happy, however, if the growers use proper seedbeds at all. Between the two surveys of table 65 intensive field work was undertaken. The differences illustrate the response of the farmers within the Vegetable Scheme.

Table 65. Seedbed Situation in the Primary Societies March and August 1968

Primary Society	Seedbeds with: Rows and Shelter March %	Rows and Shelter Aug. %	Rows only March %	Rows only Aug. %	No Rows and Shelter March %	No Rows and Shelter Aug. %
Bubale	30	35	40	40	30	25
Muyumbu	15	50	70	35	15	20
Kabanyonyi	10	20	70	60	20	20
Nyansha	20	20	40	45	40	35
Kyabugombe	20	20	30	40	50	40
Bukinda	20	40	60	45	20	15
Rutobo	25	30	35	40	40	30
Total	20	30	50	45	30	25

Source: Author's Investigations.

i. PLANTING

Soil Preparation

Within the area of the Vegetable Scheme land is cultivated with the hoe except in more stony areas where the forked hoe is sometimes in use[1]. The soil should be cultivated deeply, digging

1) A man in South-Kigezi digs an average of 78 sq.yd. per day (8.00a.m. to 5.30 p.m.).

under the weeds, in particular the so-called "Mpunica" (Galinsoga parciflora). Levelling of the cultivated soil encounters some difficulties as rakes are not yet common. In swamps people build up bankbeds to drain off excess water into small ditches between the beds.

Table 66. Average Plot Size Compared with Average Vegetable Plot Size in Different Vegetable Growing Areas in South-Kigezi

Area	Average Plot Size 1967 sq.yd.	Average Vegetable Plot Size December 1967 sq.yd.	May 1968 sq.yd.
Bubale	601	255	378
Muyumbu	752	440	463
Kabanyonyi		400	432
Nyansha		489	480
Kyobugombe		964	910
Bukinda	1,744 b)	327 a)	410
Rutobo		520	490
South-Kigezi	1,032	484	509

a) Vegetable Plot Size for Bukinda 1965 = 145 sq.yd.

b) Banana plots increase the average plot size considerably. Without the banana plots the average plot size is reduced to 583 sq.yd.

Source: Author's investigations.

The average number of vegetable fields per farmer is 1.8 whereas the average number of vegetable kinds per farmer is 4.9 (from 1 to 16).

Table 67. Average Plot Size per Individual Vegetable Variety in South Kigezi 1968

Variety	sq.yd.	Variety	sq.yd.
Artichoke	65	Kohlrabi	95
Bean French	76	Leek	115
Beetroot	47	Lettuce	76
Broad Bean	66	Onion	363
Bruss.Sprouts	84	Okra	40
Cabbage White	272	Parsley	53
Cabbage Red	141	Parsnip	36
Carrot	116	Potato sol.	466
Cauliflower	193	Pea	95
Capsicum	40	Radish	35
Celery	89	Rhubarb	17
Cucumer	20	Sweet Corn	24
Eggplant	18	Swiss Chard	97
Fennel	46	Tomato	100
Kale	104	Turnip	57

Source: Author's investigations.

Table 68. Average Number of Vegetable Varieties per Vegetable Plot 1967 and 1968

Primary Society	Number of Vegetable Varieties per Plot 1967 Average	(from - to)	1968 Average	(from - to)
Bubale	3.3	(1-14)	5.9	(1-16)
Muyumbu	4.7	(1-11)	4.2	(1- 8)
Kabanyonyi	2.9	(1-11)	2.9	(1-11)
Nyansha	2.8	(1- 5)	2.9	(2- 7)
Kyobugombe	2.5	(1- 7)	2.1	(1- 7)
Bukinda	4.2	(2- 7)	4.3	(2- 8)
Rutobo	4.2	(2- 8)	4.3	(2- 8)
South-Kigezi	3.5	(1-14)	3.8	(1-16)

Source: Author's investigations.

Planting

Rows are marked by a papyrus rope or a long straight stick. Main emphasis is laid on row planting, whereby the extension service besides better land use and easier cultivating aims at an educational effect: A farmer planting in rows shows

that he is interested in the crop and that he is able to transform advice given into practical implementation. He is then ready for further improvements. Row planting was publisized and introduced under the slogan: "More money for less work". Spacing of plants recommended using natural measurements as foot, hand, finger are compiled in table 69.

Aware of the existing danger of soil erosion the necessity of implementing anti-erosion measures is continuously stressed. The following recommendations are given:

- Maintaining the existing terraces and replacing existing "Elephant Grass " (Pennisetum purpureum) which attracts mice, etc. by Lemon Grass (Cymbopogon citratus) or Guinea Grass (Panicum maximum).
- Sowing and planting in rows across the slope.
- Planting in formation.
- Introducing intensive mulching methods.

Table 69. Direct Seeding or Growing Transplants and Recommended Spacing within the Kigezi Vegetable Scheme

Vegetable Variety	Direct Seeding	Growing Transplants	Spacing within the rows	Spacing between the rows
Artichoke		x	3 feet	3 feet
Bean French	x		1 hand width	2 feet
Beetroot	x		1 finger length	1 foot
Broad Bean	x		1 hand width	2 feet
Brussel Sprouts		x	2 feet	2 feet
Cabbage White		x	2 feet	2 feet
Cabbage Red		x	2 feet	2 feet
Capsicum		x	2 feet	3 feet
Carrot	x		1 finger width	1 foot
Cauliflower		x	2 feet	2 feet
Celery		x	1 hand length	2 feet
Cucumber	x		2 feet	3 feet
Eggplant		x	2 feet	2 feet
Fennel	x		1 finger width	2 feet
Kale		x	2 feet	2 feet
Kohlrabi		x	1 foot	1 foot

(cont'd)

Table 69. (cont'd)

Vegetable Variety	Direct Seeding	Growing Trans-plants	Spacing within the rows	Spacing between the rows
Leek		x	1 hand length	2 feet
Lettuce		x	1 foot	1 foot
Marrow	x		3 feet	4 feet
Onion		x	1 hand width	1 foot
Okra		x	2 feet	3 feet
Parsley	x		1 finger width	1 foot
Parsnip	x		1 finger len.	2 feet
Pea	x		1 hand width	2 feet
Potato sol.	x		1 foot	2 feet
Radish	x		1 finger len.	1 foot
Ruhubarb		x	3 feet	3 feet
Spinach	x		1 hand width	1 foot
Sweet Corn	x		1 foot	2 feet
Swiss Chard	x		1 hand width	2 feet
Tomato		x	1 foot	3 feet
Turnip	x		1 finger len.	1 foot

Source: UG.GOV.: District Files, Kigezi.

Because of the high share of tenders within the Union's business production has to assure continuity, quantity and variety. This is achieved by:

- succession sowing on a weekly basis
- transplanting the strongest seedlings each time
- site selection of vegetable plots according to season and expected weather conditions.

30 per cent of the farmers have vegetables of different growth stages in their field, that means they practise a certain succession system. The tool for planting is a home-made planting stick but often farmers use their hands only. Here as well, farmers are taught and are practising general aspects of vegetable growing such as deep planting of leeks and celery in trenches or firm planting of lettuce[1].

1) E. MORTENSEN and E.T. BULLARD: Handbook of Tropical and Subtropical Horticulture. Department of State, Agency for International Development, Washington D.C. 1966.

Compared to tropical areas like Kampala, etc. in Kigezi so far seedbed treatment against nematodes, etc. has not yet proved necessary. The same applies to transplanting seedlings into soil blocks advisable in the tropics. These facts are easing the tasks of the extension work and provide Kigezi vegetable growers with an advantage.

Table 70. Percentage of Farmers Practising Row Planting, 1968

Area	Leek and Celery %	Brassicaceae %	Vegetables with direct seeding %
Bubale	100	80	45
Muyumbu	100	85	40
Kabanyonyi	100	90	30
Nyansha	90	70	30
Kyobugombe	100	80	30
Bukinda	95	75	40
Rutobo	100	75	50
Total	98	79	38

Source: Author's investigations.

J. CULTIVATION MEASURES

Cultivation of Soil

Weeding and cultivating after a good rain can be regarded as common practice in the Vegetable Scheme. During the dry season farmers are urged to loosen the soil (no deep cultivating) which is usually done with an old light hoe. In areas with lighter soils, as around Rutobo, which encounter more severe dry seasons farmers are mulching, mainly tomatoes. Any material appearing suitable for mulching is being used, preferably Elephant Grass and Sorghum straw. Ridging of leeks and celery is practised remarkably well, resulting in excellent quality. Covering of cauliflower was introduced as well. Farmers only reluctantly see a point in clearing up old plants or plant remains, leaving these remains as disease carriers and disease attacks are not easily recognised being connected with this.

As against this there is a quick response if direct relations between cultivation and yield or quality and returns can be seen. A farmer for instance who did not cover his cauliflower will find on the next market day that this second grade quality cannot be sold to the Primary Society.

Pest and Disease Control

The comparatively high cost of spraying equipment (the cheapest sprayer shs 60) and chemicals has retarded their successful introduction so far. As a temporary solution powdered chemicals in dusting tins have met better response (shs 2 to 2.50 per tin). Mostly three different insecticides are applied:

- against insects attacking leaves (Agrocide)
- against soil pests (Alandrin)
- against pests in stores (Gammalin).

As farmers tended to forget the names of the different chemicals the extension service within the Vegetable Scheme made use of the differently coloured labels, e.g. green label against pests on leaves, etc. Farmers showed keen interest and purchases of chemicals increased until the firm producing the chemicals changed the labels completely into a more modern design without taking into account the difficulties which might arise at the farmers' end.

In South-Kigezi the promising start was considerably slowed down. In general the lack of interest of firms producing and dealing with chemicals for pest and disease control or fertilizers in building up a market among African smallholders has been noticed. In their endeavour to gain immediate profits, only those area and customers are given attention and serive who promise to bring high returns (e.g. Tea estates, etc.). Compared with what happens in Europe, the African smallholder incorporating a future potential for the market of these firms has not yet been paid the necessary attention in the form of free advice, samples, etc.

Very good results obtained by members in Kabanyonyi area in spraying their tomatoes against fungi attacks during rainy seasons are slowly recognised by other growers as well. This system of creating good examples is regarded as the most promising way for the introduction of more sophisticated cultivation methods such as pest and disease control. When applying poisonous insecticides to vegetables the following difficulties arise because of the lack of experience of the farmers in pest and disease control measures:

- the chemicals might cause harm to people
- the directions might not be followed correctly leading to overconcentration (problem of high percentage of illiterates and the many languages)
- the time between application date and harvesting might be too short.

Therefore, as far as possible less dangerous chemicals are recommended. 1968 approximately 10 per cent of the farmers within the Kigezi Vegetable Scheme were practising some sort of pest and disease control. (Main pests and diseases see table 71.)

Fertilizers

Fertilizer trials were started in 1967 and 1968 and are one of the main programmes for the future. Difficulties arise from:

- prices for fertilizer
- inexperience in and lack of understanding among farmers of the complexities of soil fertility
- the remarkable differences in soil components and fertility within one plot
- the fact that applying of manure and compost has not yet gained footing in agriculture in South-Kigezi although it has been intensively publisized by the Department of Agriculture since 1946.
- the lack of interest on the fertilizer producers' and distributors' side in establishing a market among African smallholders
- the lack of funds for demonstration and field trials.

The problem of decreasing soil fertility in South-Kigezi will have to be solved in the near future. The "terrace effect" (see chapter C,I,2,c) cannot be abolished only by pulling down the terraces. It is unlikely that the terraces existing will be shifted into the middle of the plots. This measure as well as cultivating towards the hillside would improve soil fertility only for a short period. One day the withdrawn nutrients will have to be replaced.

One has to be very careful when introducing application of chemical fertilizers. The changing composition of the soils does not ensure in every case a marked increase in productivity (valley bottoms, etc.) A farmer applying fertilizer to a plot may find no increase in yield and subsequently might start to regard any further application in his farm as a waste of time and money. In order to avoid too many difficulties for the growers, complete fertilizers (N-P-K = 10-10-10) are recommended for vegetable growing.

Table 71. Pests and Diseases Considerably Affecting Vegetable Production in South-Kigezi

Vegetable Variety	Pest or Disease
Bean French and Broad Bean	Doralis fabae, Hylemyia cilicrura, Mromyces phaseoli.
Cole Crops	Xanthomanas campestris, phema lingam, Peronospora brassicae, Phyllotreta, Agrotis spp.
Carrot	Psila rosea, Alternaria porri.
Cauliflower	Deficiency of boron and molybdenum, others see cole crops.
Celery	Septoria apii.
Cucumber	Plasmopora cubensis, Erysiphe cichoriacearum.
Lettuce	Scleritinia sclerotiorum, Bremia lactucae, Agrotis spp.
Onion	Peronospora destructor, Botrytis allii.
Pea	Acrythosiphon onobrychia pisi, Erysiphe polygoni.

(cont'd)

Table 71. (cont'd)

Vegetable Variety	Pest or Disease
Potato sol.	Phytophthora infestans, Bacterium sependan, Blanjulus and Cylindrojulus.
Rhubarb	Gastroplupa viridula.
Swiss Chard	Cercospora beticola.
Tomato	Septoria lycop. Phytophthora infestans, Blossom end rot.

K. HARVESTING

Aspects which should be remembered when harvesting fresh vegetables are:

- the correct stage of maturity
- freshness
- cleanliness
- preparation for market

Stage of Maturity

Until 1965 the farmers did not know how many of the vegetables growing in Kigezi were cooked and eaten. Thus they must have found it difficult to judge the proper stage of maturity for harvesting. Intensive information and demonstration work in the field, in individual houses and at the District Farm Institute slowly increased understanding and in addition interest in proper preparation of second grade vegetables for home consumption by the farmers (see chapter D,III,2). Posters and grading rules at the Primary Society stores quickly taught the growers to remember the maturity signs for harvesting of the different kinds of vegetable, e.g. hard heads of cabbage, showing of shoulders of carrots, etc. The best teaching method was the effect of the farmers' mistakes on their income.

Freshness

Most vegetables are harvested on the morning of the market day. Since the market starts at 10.00 a.m., the products reach the market often still moist with dew. This fact and ceaseless rains during the rainy season which do not allow the vegetable to dry up cause considerable losses during the relatively long time of transporting by:

- loss in weight through drying up and evaporation
- wastage if the wet products cannot be immediately sold after arrival at the depots.

However, the 24 hours spent between harvesting and delivery to the consumers are a relatively short time taking into consideration the distance of 265 miles between Kigezi and Kampala, the main market outlet.

Cleanliness of the Products

All vegetables bought by the Primary Societies have to be in a marketable condition. This also applies to dirties products. In Kigezi the abundance of water offers at least during transport to the market place possibilities for washing the vegetables. Dirty vegetables are not accepted by the co-operative.

Preparation of Vegetables for Market

Continuous advice and demonstration during market days and rejection of improperly prepared products gently force the farmer to use the right techniques, such as trimming of dirty or damaged leaves, not cutting beetroot, etc.[1]. Principally, the vegetables are prepared in accordance with international regulations as far as possible.

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1) O.E.E.C.: Documentation in Agriculture and Food: 47 International Standarisation of Fruit and Vegetables, Paris, 1961.

1. YIELDS

Yields of table 72 taken from the Department of Agriculture mimiographed "Vegetable Growing Guide for Uganda" by A.G.K. WILL, can be averaged in South-Kigezi. Yields especially in smallholder production differ greatly according to soil, climate and cultivation methods of course.

Table 72. Yields in Tons per Acre of Different Kinds of Vegetable in Uganda

Kind	tons/acre	Kind	tons/acre
Artichoke (pieces)	16,000	Kohlrabi	4
Bean French	2	Leek	4
Bean Runner	3	Lima Bean	1.5
Beetroot	3	Melon	8
Broad Bean	2.5	Marrow	6
Broccoli	2	Onion	5
Brussel Sprouts	3	Okra	4
Cabbage White	8	Parsley	4
Cabbage Red	6	Parsnip	8
Carrot	8	Pea	1.5
Capsicum	2	Potato sol.	4
Cauliflower	4	Radish (bunches)	10,000
Celery	8	Rhubarb	1
Cucumber	3	Spinach	2
Eggplant	4	Swiss Chard	4
Fennel	6	Tomato	8
Garlic	2.5	Turnip	5
Kale	6	Lettuce	4

Source: A.G.K. WILL: Vegetable Growing Guide for Uganda, Department of Agriculture, Entebbe.

Table 73 gives the yield per seed packet of each kind of vegetable grown within the Vegetable Scheme in South-Kigezi. Due to the character of vegetable growing in Kigezi (see table 66 and 67) and the production planning on a seed packet basis, these figures are more relevant for the Vegetable Scheme than yields per acre.

Table 73. Average Yield per Seed Packet, Average Number of Seeds per Packet and Average Number of Plants per Seed Packet Raised in Seedbed

Kind	Yield lbs/Packet	Seedbed Seeds/Packet	Plants raised per Packet
Artichoke a)	7	130	33
Bean French	90	360	94
Beetroot	49	135	93
Broad Bean	20	30	25
Brussel Sprouts	146	1,300	288
Cabbage White	985	1,000	591
Cabbage Red	658	1,100	492
Capsicum	95	580	99
Carrot	83	3,500	644
Cauliflower	388	1,450	548
Celery	333	7,400	1,175
Cucumber	61	170	52
Eggplant	90	820	38
Fennel	109	350	154
Kohlrabi	166	1,200	266
Leek	279	1,300	499
Lettuce	631 heads	2,353	825
Okra	-	3	80
Onion	63	1,040	277
Parsley	107	2,250	359
Parsnip	112	600	100
Pea	35	340	71
Radish	20 bdl.à 10	530	202
Rhubarb	100	40	24
Sweet Corn	100	410	48
Swiss Chard	262	180	130
Tomato	790	700	392
Turnip	95	1,700	439

a) Yield per season; one plant yields for 2 to 3 years.

Source: Author's investigations

The difference between seeds per packet and the plants raised per packet within the Vegetable Scheme demonstrates very clearly the necessity of the extension work's concentration on seedbed work and simple cultivation methods.

m. **GRADING**

Each of the Primary Societies has two or three committee members trained in vegetable grading. They are responsible for grading the products brought by the members on the market days, assisted by the Field Assistant in charge of the area. Within the marketing system of the Kigezi Vegetable Scheme three quality checks have been established:

- detailed grading at the grading tables of the Primary Societies by the committee members in charge
- additional control of the graded products before weighing and buying
- control of the vegetables by the Union staff during weighing and purchase of the product from the Primary Society.

Until 1965 vegetables were, however, graded into first and second grade and subsequently bought at graduated prices from the farmers. But often everything got mixed up again on the lorry lowering the value of the whole consignment at the marketing end. In 1965 this system was changed into distinguishing good and lower quality. Whereas the good quality is bought by the Primary Society, the lower quality is rejected and is mostly used for the farmers' own consumption. Reasons for this change were:

- The vegetables from Kigezi had to get a good name on the market. The possibilities of second grade products from Kigezi reaching the consumers had to be eliminated.
- As long as the grower was still offered the possibility of selling the lower quality, the necessity of improving quality did not seem evident enough.
- In order to cut down the time between harvesting and delivering to the customers and to simplify the procedure of buying having one price and quality standard per vegetable kind only made things easier to handle.

Table 74 brings out the most important points which have to be taken into account for grading within the Kigezi Vegetable Scheme. The following method of teaching the farmers to be aware of quality and selection shows good results: The grower, who has never seen the marketing end, is offered, e.g. two carrots, one of good quality and one of bad quality and asked to choose the one he would buy. Of course, he always takes the better quality. Then he is told that the consumer is going to act similarly and therefore only good products can be bought. This simple example is usually well understood and the reason for grading accepted.

Table 74. The Main Grading Aspects within the Marketing System of the Kigezi Vegetable Scheme

Variety	Grading
Artichoke	Marketable size, closed, undamaged, not overripe, with short stalks.
Bean French	Undamaged, stringless and not overripe or yellow, control by breaking beans when grading.
Beetroot	Clean undamaged roots, cut leaves one finger in width above the root, reject small or overripe products.
Broad Bean	Pods undamaged, only long quality.
Brussel Sprouts	Well closed sprouts without yellow or damaged leaves, reject small sprouts.
Cabbage White and Red	Closed, hard and undamaged. No yellow leaves, clean cut stalk, heads not too small reject soft quality.
Carrot	Clean, undamaged, no cracks, all leaves removed, no small roots, reject products damaged by insects.
Cauliflower	White well formed flower, not smaller than a fist, leave enough leaves for protection but not too many, reject overripe and spoiled products.
Capsicum	Undamaged and well formed quality.

Table 74. (cont'd)

Variety	Grading
Celery	Only strong quality, blanched, undamaged, clean, without roots, tops of leaves cut, bundled, reject too thin products.
Cucumber	Clean, undamaged, not too small and overripe.
Eggplant	Clean, without leaves or long stalks, undamaged, reject small or half green fruits.
Fennel	Clean, undamaged, no roots, leaves cut one hand in width above the bulb, reject too small products.
Kale	Clean, without yellow or damaged leaves, bundled.
Kohlrabi	Undamaged, clean, without cracks, not stringy or overripe, roots and leaves remove, reject too small or overripe products.
Leek	Clean, undamaged, long white, thick and straight quality, roots and tops of leaves removed, bundled, reject thin or short products.
Lettuce	Clean, undamaged solid heads with wrapper leaves, no yellow leaves, reject soft or too small heads.
Onion	Undamaged, clean, dry quality, not too small and without leaves. Grade local varieties separately.
Parsley	Clean, undamaged, bundled without yellow leaves and roots.
Parsnip	Well shaped, undamaged roots without leaves, reject thin quality.
Pea	Clean, undamaged pods, neither soft nor yellow and overripe.
Potato sol.	Clean, undamaged and dry tubers, reject too small or green products.
Radish	Clean, undamaged, no bursts, not overripe, soft or stringy, bundles with ten pieces and with leaves.
Rhubarb	Clean, undamaged, solid and thick stems, leaves removed, bundled, reject stems with insect damage.
Swiss Chard	Clean, undamaged, without yellow leaves, bundled.
Tomato	Clean, undamaged, well shaped, solid quality, yellow to red fruits, reject small, overripe or green products.
Turnip	Clean, undamaged roots, leaves cut, reject too small or overripe products.

n. COST OF PRODUCTION

Table 75 shows the cost of production for five main products: Cabbage white, Carrot, Cauliflower, Leek and Turnip. Basis for the investigations was the yield obtained from one seed packet. The average distance to the market is 5 miles, and labour costs were rated at shs 3 per day.

Table 75. Cost of Production per Seed Packet within the Kigezi Vegetable Scheme

Cabbage White:		
Average Number of Seeds per Packet: 1,000		
Yield per Seed Packet:	985 lb	
Producer Price Shs:	0.05 lb	
Gross Return in Shs:		49.15
Labour Cost in Shs: (3 days per Shs 3.00)	9.00	
Expenses for Material and Depreciation:	2.00	
Costs per Seed Packet:	0.30	
Transport Costs:	20.00	31.30
Net Profit per Seed Packet		Shs 17.85
Carrot:		
Average Number of Seeds per Packet: 3.500		
Yield per Seed Packet:	83 lb	
Producer Price Shs:	0.10 lb	
Gross Return per Seed Packet Shs:		8.35
Labour Costs: (1 day per Shs 3.00)	3.00	
Expenses for Material and Depreciation:	0.50	
Costs per Seed Packet:	0.30	
Transport Costs:	2.00	5.80
Net Profit per Seed Packet		Shs 2.55
Cauliflower:		
Average Number of Seeds per Packet: 1,450		
Yield per Seed Packet:	388 lb	
Producer Price in Shs:	0.14 lb	
Gross Return in Shs:		54.55
Labour Costs: (3 days per Shs 3.00)	9.00	
Expenses for Material and Depreciation:	2.00	
Costs per Seed Packet:	3.00	
Transport Costs:	10.00	24.00
Net Profit per Seed Packet		Shs 30.55

Leek:

Average Number of Seeds per Seed Packet: 1,300		
Yield per Seed Packet:	279 lb	
Producer Price Shs:	0.10 lb	
Gross Return in Shs:		27.95
Labour Costs: (4 days per Shs 3.00)	12.00	
Expenses for Material and Depreciation:	2.00	
Costs per Seed Packet:	0.40	
Transport Costs:	8.00	22.40
Net Profit per Seed Packet		Shs 5.55

Turnip:

Average Number of Seeds per Packet: 1,700		
Yield per Seed Packet:	95 lb	
Producer Price Shs:	0.04 lb	
Gross Return in Shs:		3.85
Labour Costs: (1/5 day per Shs 3.00)	0.60	
Expenses for Material and Depreciation:	0.50	
Costs per Seed Packet:	0.20	
Transport Costs:	2.00	3.30
Net Profit per Seed Packet		Shs

Source: Author's investigations.

2. THE ORGANIZATION OF THE VEGETABLE GROWERS

a. THE CO-OPERATIVE SELF GOVERNMENT

The seven Primary Co-operative Societies form the "Kigezi District Vegetable Growers Co-operative Union Ltd.". Products of three associated Potato Growing Societies are also channelled through the Union's marketing facilities:

- Kahungye Potato Growing Society in Ikumba sub-county.
- Bwindi Potato Growing Society in Ikumba sub-county.
- Muko/Kashenyi Potato Growing Society in Muko sub-county.

The rules of co-operative self-government follow the regulations of the co-operative movement in Uganda.

The Primary Co-operative Societies

Main event during the co-operative year is the Annual General Meeting. The members present elect:

- 7 to 9 committee members including
  - 1 chairman
  - 1 vice-chairman
  - 1 secretary
  - 1 treasurer
  - 3 to 5 committee members
- Out of the committee members the representatives for the General Meeting of the Union (for every 100 members one representative.)

The members present decide on:

- the allowances for the committee members
- they approve the balance sheet prepared by the Co-operative Department and decide on the distribution of the profit.

The committee of the Primary Society usually meet once every month beside their work at the weekly market day. The guide-line for reorganization of the Kigezi Vegetable Scheme was to put the Union as well as the Primary Societies on the basis of "self help first"[1]. The Union granted the Primary Societies a single loan to purchase a scale and vegetables on their first market day. This loan was paid back by all Societies within one year after their formation.

The Primary Societies revenues come from:

- the share of a new member (shs 20) and his entrance fee (shs 1)
- the margin between producer price and price paid by the Union (shs 0.01 to 0.02 per lb).

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1) FAO: New Approach to Agricultural Credit, Rome 1964, p.11.

Table 76. Development of the Primary Societies' Funds 1965 - 1968 in Shs

Society	Feb.1966	Aug.1966	Aug.1967	Aug.1968
Bubale	3,890.75	5,900.10	5,763.20	6,544.55
Muyumbu	-	2,264.25	7,757.40	13,201.80
Kabanyonyi	1,792.60	3,314.70	5,706.55	10,920.75
Nyansha	2,098.35	2,812.55	5,339.10	7,522.50
Kyobugombe	1,865.00	4,616.20	12,226.45	18,899.30
Bukinda	1,567.65	3,111.75	8,497.00	11,994.10
Rutobo	1,076.00	2,521.10	5,308.45	8,709.60
Total	12,290.35	24,541.20	50,598.15	77,792.60

Source: UG.GOV.: District Files, Kigezi.

One of the advantages of decentralisation into seven Primary Societies is the possibility of evaluating and comparing their balance sheets. Each member can check revenues and expenditure of his own Society and compare with other Societies. The result of these possibilities was made plain e.g. in the members' active motions against their own committee members' unnecessary or exaggerated expenses. Such comparisons applied properly proved to be an excellent aid for the co-operative education of the members.

Table 77. Daily Allowances for Committee Members of Different Primary Societies 1967/68 in Shs

Society	Chairman, Treasurer Secretary	Committee Members
Bubale	4.00	3.00
Muyumbu	4.00	3.00
Kabanyonyi	4.00	3.00
Nyansha	4.00	3.00
Kyobugombe	4.00	3.00
Bukinda	4.00	3.00
Rutobo	3.50	2.50

Source: UG.GOV.: District Files, Kigezi.

In 1965 one Society distributed a bonus. During the following years all general meetings renounced granting dividends and decided to use their profits for improvements of their stores and to accumulate capital for shares in the expected vegetable dehydration plant. The average annual bonus to be expected per member would have been 8 to 11 cents per shilling business with his Primary Society.

Until now the members of the Primary Societies have shown an exemplary co-operative sense, which could not be surpassed by members in countries with longer co-operative tradition. All committee members who did not want to work hard enough for the co-operative, who had been elected because of religious or political reasons or who had been found guilty of favouritism were gradually replaced during the following elections. The scale of judgement is becoming more and more the individual's knowledge and his readiness to serve the community The idea of electing younger candidates to gain experience in the committee work has been applied widely. Mainly secretaries are being choosen from the younger generation of committee members.

Within three years bookkeeping in the Primary Societies has reached a remarkably high standard. Except for one accident in 1965 so far no money has been lost since the Primary Societies were first started. Whenever any amount was missing it was refunded by the committee members. This fact proves that African co-operatives can function as well as those in other countries, if from the start, besides the ordinary control, enough time and patience is spent in instructing and teaching. Negative results of African co-operatives are often caused by the poor and disinterested performance of the instructors who did not make enough efforts properly to teach farmers their rights and duties. The quick expansion of the co-operative movement without the necessary trained personnel is one of the reasons of the failures in many co-operatives.

Table 78. Annual Accounts of the Primary Societies 1967/68 (in Shs)

Account	Bubale	Muyumbu	Kabanyonyi	Nyansha	Kyobugombe	Bukinda	Rutobo
Members	347	357	301	218	245	370	233
Cash b/f 1966/67	1,086.20	746.60	700.95	707.60	965.35	525.00	1,128.45
Vegetable Sales	49,990.55	41,247.45	36,333.50	26,925.45	64,248.45	43,793.25	42,340.40
Shares	780.00	380.00	1,520.00	280.00	260.00	880.00	520.00
Entrance Fee	35.00	19.00	76.00	14.00	13.00	44.00	26.00
Part Shares	10.00	-	-	36.00	43.00	553.00	-
Bank Withdrawal	980.00	-	500.00	1,600.00	1,350.00	-	-
Fines	-	-	-	-	-	10.00	-
Building Costs	580.30	-	511.00	-	65.00	210.00	-
Miscellaneous	30.00	-	4.00	99.80	130.00	-	57.00
Repayments	10.25	-	-	-	-	508.05	-
Total Income	53,502.30	42,393.05	39,645.45	29,662.85	67,074.80	46,523.30	44,071.85
Vegetable Purchases	45,364.25	32,440.45	30,047.30	21,508.85	54,815.75	38,902.40	37,822.85
Committee Allowances	2,973.00	3,363.50	2,477.10	1,876.45	2,971.40	2,362.30	1,432.90
Travelling	10.50	-	-	-	-	124.00	-
Stationary	272.30	251.80	309.60	122.00	336.45	304.05	117.00
Entertainment	3.75	38.00	218.00	47.10	-	359.50	-
Bank Deposit	1,844.00	5,219.45	4,595.00	3,560.00	7,455.00	1,500.00	1,700.00
Building Repairs	2,275.40	10.00	126.30	590.00	25.00	428.00	4.00
Audit Fee	72.00	78.70	52.00	72.00	123.00	84.45	50.00
Furniture	-	55.00	-	84.00	-	45.00	120.00
Profit Distribution	-	-	-	1,055.45	-	-	-
Court Fees	-	116.80	-	-	-	-	-
Money Outstanding	20.85	-	118.50	-	-	130.00	-
Polio Fund	-	2.00	-	-	-	-	-
Cash at Hand	646.25	767.35	1,681.65	747.00	1,342.20	2,283.60	2,659.10
Total Expenditure	53,502.30	42,393.05	39,645.45	29,662.85	67,074.80	46,523.30	44,071.85

Source: UG.GOV.: District Files, Kigezi.

After the vegetable co-operatives had proved able to conduct their business independently and without monetary aid, it was decided to accept the assistance of a foreign agency for the improvement programme of the stores and to ask for money for concrete floors and roofing of grading tables. As the members had so far achieved everything themselves and had not yet been spoiled by wrongly applied development aid, this relatively small present was regarded as an extraordinary sign of acknowledgement and reward for their co-operative endeavours.

The Kigezi District Vegetable Growers Co-operative Union

The representatives of the Primary Societies, whose number per Society depends on the Societies membership[1] elect the nine committee members of the Union at the Annual General Meeting. Two sub-committees consisting of three members each are formed as well:

- sub-committee for transport and packing
- sub-committee for price policy

with the aim to ensure quicker decisions and to reduce committee expenses.

The Primary Societies delegate members whom they think most capable. When electing the Union committee, every Society has to be represented with at least one committee member. The changes among the delegates reveal a transformation within the leading group of the Primary Society giving the younger generation greater say and more duties. After being taught to make use of their rights the members have started to replace representatives who did not want to work for the benefit of the whole community. This process has to be favourably judged as some of the members who had managed to be elected as delegates since 1961 were said to be more concerned with political and religious matters within the business of the co-operative than with the necessary technical aspects.

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1) Membership: 1-149 = 1 Representative, 150-249 = 2 Representatives, 250-349 = 3 Representatives.

It is hoped that in the years to come the present list of committee members will not undergo marked changes to ensure the continuity of work done by the committee. Too many replacements carry the danger of negatively influencing the committee members' training and the Union's business performance. This point is of great weight in regard to young agricultural co-operatives retarding their development seriously.

Whereas in 1965 the Union Committee consisted of the older guard of the co-operative, in 1968 the younger had prevailed considerably, the average of whom were offering higher educational standards, more sense for business and better understanding. It is a good sign of co-operative sense starting to take root among the members after many years of unfortunate experiences with committee members who were mostly interested in the political and religious advantages gained, that the farmers are electing impartial and capable leaders now without considering their private background. The example and the determination of the extension staff, who did not allow any agitations not concerned with problems of vegetable growing and marketing during meetings, had a positive influence on this development. One example should illustrate the present situation: In 1967 a Primary Society committee all of whose members except one belonged to one religion elected as treasurer this member who was not of their faith because he seemed to them the most suitable. For those who know the conditions in Kigezi during the past, this decision and development is striking and reveals an encouraging sound trend.

The Union committee duties are:

- to assign and supervise the Union staff
- to supervise the sub-committees
- to deal with and decide on questions and proposals submitted by the management during the monthly meetings.

All replies have to be done in writing.

The allowances per day per member amounted in 1968 to:

Within Kigezi: Shs. 7.00 per day (1965: Shs. 5.00)
Outside Kigezi: Shs.12.00 per day (1965: Shs. 7.00).

Table 79 shows the financial development during the last two years of private enterprise (1958-1960), the Kigezi Growers Co-operative Society, 1961-1965, and the Kigezi District Vegetable Growers Co-operative Union 1965-1968.

Table 79. Revenue, Expenses and Profits of the Kigezi Vegetable Union and its Predecessors 1958-1968

Year	Revenue Shs	Expenses Shs	Losses Shs	Profits Shs
1958/59	316,219.00	338,302.00	22,083.00	-
1959/60	230,398.44	248,909.66	18,511.22	-
1961/62	227,113.34	223,095.13	-	4,276.23
1962/63	260,633.26	252,791.71	-	8,473.84
1964/65	329,153.04	337,914.87	8,557.03	-
1965/66	388,569.95	378,129.80	-	12,302.25
1966/67	457,253.85	438,136.35	-	22,985.25

Source: UG.GOV.: District Files, Kigezi (Extracts from balance sheets).

b. THE DELIVERY TO THE MARKET

The vegetables mostly harvested in the early morning and prepared for market are carried mainly as headloads to the stores of the Primary Societies. Other transport facilities are the bycicle (approximately 5 to 10 per cent of the growers own a bycicle) and in some cases the bus or the pick-up.

The average distance between vegetable plot and Primary Society store is 5 miles (see map 5). At the store the farmer has to pass four stages

- grading
- weighing
- purchase by the Primary Society (receipt and cash)
- seed distribution.

All these duties are now conducted by committee members whereas in 1965 a relatively high amount of work was still done by hired labour. The treasurer keeps in his cash box from the previous market day enough cash to pay the farmers. The rest he has to deposit with a Kabale bank. Receipts for the farmers are issued in three copies:

- for the farmer
- for determination of bonus in case of distribution
- for the Primary Society disposal in the receipt book.

Besides this the treasurer and secretary enter the purchases from each member per market day in a separate membership book in order to be prepared for the adding up of the annual business or each member with the Society and at the same time to receive an idea of the activities of the individual members.

The following tables 80 and 81 show the results of the deliveries of 700 holdings between 1965 and 1967. The selected Primary Societies represent characteristic groups:

- Kabanyonyi, a very progressive vegetable growing area
- Muyumbu, a market with an extraordinary selection of vegetables, situated close to Kabale
- Nyansha, a growing area with fair results, encountering difficulties of retraining old "experienced" vegetable growers
- Bubale, a Primary Society with two market days at mile 2 and 4. The producers at mile 2 have to be categorized as typical housegarden growers. At mile 4 the share of potatoes is high.

Table 80. Number of Examined Holdings

Society	1965/66	1966/67	1967/68
Kabanyonyi	188	226	248
Muyumbu	321	347	-
Nyansha	-	-	215
Bubale	172	316	327
Total Holdings	681	889	790

Source: Author's investigation.

Table 81. Percentage of Non-Productive Members

Society	1965/66	1966/67	1967/68
Kabanyonyi	29.3	22.1	18.9
Muyumbu	20.6	20.8	-
Nyansha	-	-	26.5
Bubale	6.9	35.2	34.5
Average of all Holdings	18.9	26.0	26.6

Source: Author's investigation.

The percentage of members not producing vegetables especially the rise at Bubale Society indicates that vegetable growing is regarded as a safeguard by many people becoming member enabling them to take up vegetable growing during periods of economic crises or whenever cash is lacking.

Table 82. Percentage of each Variety of Vegetable marketed by the Primary Societies 1967

Variety	Percentage of total Vegetable Quantity							
	Bu.	Mu.	Ka.	Ny.	Ky.	Bk.	Ru.	Union
Artichoke	0.1	0.3	0.2	0.2	0.1	0.1	0.1	0.1
Bean French	0.4	0.3	0.2	0.2	0.3	0.4	0.6	0.3
Beetroot	0.7	0.8	0.6	0.5	0.8	0.4	0.5	0.7
Broad Bean	0.8	1.0	0.5	0.6	0.7	0.8	0.3	0.6
Bruss.Sprouts	0.8	0.6	0.5	0.2	1.3	0.6	0.1	0.7
Cabbage White	38.5	43.8	39.8	47.0	41.7	47.5	44.0	41.7
Cabbage Red	3.8	4.4	3.9	2.9	2.1	2.0	4.4	3.0
Capsicum	0.6	0.2	0.1	0.1	0.1	0.2	0.1	0.2
Carrot	3.6	6.4	0.2	8.2	9.1	5.4	5.1	6.5
Cauliflower	5.2	18.2	25.5	12.1	12.9	10.3	6.3	12.4
Celery	1.9	1.5	0.6	1.6	1.0	2.4	1.3	1.4
Cucumber	-	-	-	-	-	.	.	.
Eggplant	.	-	-	-	-	0.2	0.1	.
Fennel	0.2	0.5	0.2	0.1	0.3	0.3	0.5	0.3
Kale	0.2	0.4	0.2	0.1	0.3	.	.	0.2
Kohlrabi	1.3	1.0	1.1	0.6	0.6	0.6	0.7	0.8
Leek	2.2	3.0	1.8	2.1	1.6	1.3	0.6	1.8
Lettuce	1.0	5.8	4.3	4.1	3.2	3.6	0.5	3.1
Onion	.	-	-	.	0.6	3.1	8.0	1.4

(cont'd)

Table 82. (cont'd)

Variety	Bu.	Mu.	Ka.	Ny.	Ky.	Bk.	Ru.	Union
Parsley	0.1	0.2	0.2	0.1	0.1	.	0.1	0.1
Parsnip	.	0.5	0.4	0.3	0.1	.	.	0.2
Pea	.	.	0.1	0.1	0.3	0.1	0.1	0.1
Potato sol.	29.7	0.5	0.6	9.3	13.4	2.6	8.8	12.8
Radish	1.1	0.5	0.7	0.5	0.3	0.4	0.6	0.6
Rhubarb	0.1	.	.	-	.	-	.	.
Swiss Chard	6.8	8.0	7.4	7.5	6.9	7.5	7.3	8.0
Sweet Corn	.	0.2	.	0.1	0.2	-	0.1	0.1
Tomato	.	0.1	1.4	.	0.2	8.6	9.3	2.1
Turnip	1.0	1.6	1.8	1.5	1.9	1.4	0.6	1.4

Source: UG.GOV.: District Files, Kigezi.

Table 83. Production of Vegetables by Primary Societies

Society	Lbs. 1967	Lbs 1968	Lbs Increase	% Increase
Bubale	406,216	575,182	168,966	41.5
Muyumbu	433,949	466,618	32,669	7.5
Kabanyonyi	288,783	388,960	100,177	34.6
Nyansha	266,372	316,996	50,624	19.0
Kyabugombe	504,730	592,955	88,225	17.4
Bukinda	347,448	385,438	37,990	10.9
Rutobo	243,464	324,951	81,487	33.4
Kahungye	90,609	102,089	11,480	12.6
Bwindi	-	76,660	76,660	
Muko/Kashengi	-	25,946	25,946	
Total	2,581,571	3,255,795	674,224	26.1

Source: UG.GOV.: District Files, Kigezi.

c. PRODUCER PRICES AND BUYING RESTRICTIONS

Producer Prices

The returns of any cash crop introduced in Kigezi have been compared with possible profits gained by selling subsistence crops like sorghum, sweet potato, etc. In cases where the new crop is only bringing approximately the same amount of money it does for many growers not seem lucrative enough because in South-Kigezi,

with its high population density, the subsistence crops mostly find a ready market. The efforts involved in introducing a new crop must pay out. What is asked by the farmers is a profitable production yielding cash money preferably. Table 35 provides a picture of the average prices of main crops in Kigezi.

Thus the vegetable producer prices have to be adjusted to the other crops on one hand in order to encourage production. On the other hand the vegetable producer prices are the result of the Vegetable Union's price policy based on:

- the tender prices usually representing the average price at the market and within the Kigezi vegetable business amounting to more than 50 per cent of the income,
- fixed costs of the Vegetable Union,
- losses and wastage of products playing an important role when dealing with perishable products such as vegetables.

Consequently the prices paid by the Union to the Primary Societies are calculated as follows:

tender price
- fixed costs (Shs. 0.10/lb)
- wastage (ca. 25 % of the producer price)

price per lb paid by the Union to the Primary Society.

From the price the Union is paying the Primary Societies keep Shs 0.01 to 0.02 per lb. for covering their costs. The decision about the Primary Society deduction is made by the committee of each Society. Thus the final producer price remains:

Price paid by the Union to the Primary Society
- running costs of the Primary Society in Shs per lb.

= producer price

The price fluctuations at the marketing end are carried by the Union. Only in extreme cases the Union corrects the fixed prices to the Primary Societies. Experience proved that frequent price fluctuations usually occurring at the market would frustrate and irritate growers as well as Primary Society committees influencing the necessary continuity in production. The Union's medium prices offered to the Primary Societies are calculated in a way that they level out during the year, even though the Union passes times of actual losses (see table 87). In case of a producer price adjustment the Primary Societies have to be informed eight days in advance.

The determination of the price the Union pays to the Primary Societies is a matter of experience and mercantile sense. Table 84 shows the development of the Union (or its predecessor) prices since 1961. The prices before 1961 have been quoted in table 48.

Table 84. Development of the Vegetable Prices Paid by the Kigezi Vegetable Union

Variety	1961 Shs/lb	1965 Shs/lb	1967 Shs/lb	1968 Shs/lb
Artichoke	0.05	0.03-0.05	0.06	0.06
Bean French	0.10	0.10-0.20	0.11	0.11
Beetroot	0.10	0.10	0.11	0.11
Broad Bean	0.10	0.10-0.20	0.11	0.11
Bruss. Sprouts	0.20	0.10-0.15	0.16	0.16
Cabbage White	0.03	0.03-0.07	0.07	0.07
Cabbage Red	-	-	0.08	0.08
Capsicum	-	0.10	0.11	0.11
Carrot	0.07	0.05-0.10	0.10	0.12
Cauliflower	0.10-0.15	0.07-0.20	0.16	0.16
Celery	0.15	0.10-0.15	0.11	0.12
Cucumber	-	-	0.11	0.11
Eggplant	-	-	0.11	0.11
Fennel	-	-	0.11	0.11
Kale	-	-	0.06	0.06
Kohlrabi	-	-	0.06	0.06
Leek	0.10	0.10-0.15	0.11	0.12
Lettuce (head)	0.05	0.03-0.10	0.07	0.11
Marrow	-	-	-	0.06
Onion Local	0.30	0.20-0.40	0.26	0.32
Onion Union	-	-	0.32	0.41
Okra	-	-	0.11	0.11

(cont'd)

Table 84. (cont'd)

Variety	1961 Shs/lb	1965 Shs/lb	1967 Shs/lb	1968 Shs/lb
Parsley	-	-	0.11	0.11
Parsnip	0.05	0.10-0.15	0.11	0.11
Pea	0.20	0.10-0.20	0.21	0.21
Potato sol.	0.10	0.10-0.15	0.11-0.20	0.16
Radish (bundle)	-	-	0.04	0.04
Rhubarb	-	0.10	0.06	0.06
Spinach	-	-	-	0.06
Sweet Corn	-	0.06	0.06	0.06
Swiss Chard	0.05	0.03-0.05	0.06	0.06
Tomato	0.30	0.10-0.25	0.21	0.21
Turnip	0.05	0.03-0.05	0.06	0.06

Source: UG.GOV.: District Files, Kigezi

The fact that the producer prices during the harvesting season in Germany are even dropping below those paid in Kigezi reveals the following aspects:

- The returns gained by African farmers are not always lower than those of their European colleagues. This fact is often overlooked when trying to export fresh or processed products from African countries.
- With regard to yields per land unit there is still a big discrepancy. Introduction of measures and methods increasing yields and improvement of the educational standards offer a wide potential for the African farmer.

As everywhere the Kigezi vegetable growers show a most conservative attitude towards producer price reductions by decreasing interest in growing the affected vegetables[1]. On the other hand an increase of producer prices proves to be the surest stimulus for higher production[2].

1) W.A. LEWIS: Development Planning, New York 1966, p.45.

2) J.C. ABBOTT: Marketing Problems and Improvement Programs FAO, Rome 1958, p.118.

The Union is using the correlation between price and production to reduce production of vegetables which are in overproduction and to shift over to varieties with more promising marketing demand. In 1968 the Union started to announce price increases in advance for special vegetables and seasons when it was known that these products would come in short supply. The time for announcing the price was the planting time of the products, co-ordinated with a campaign by the field staff concentrating their field work on the products in question. It was found that the farmers acted promptly. Good results were obtained so far with lettuce, potatoes sol. and carrots.

Buying Restrictions

In spite of all regulations with regard to production, seasonal periods of overproduction are occurring, which have to be obviated by buying restrictions. The manager in Kampala as well as the sales assistants in Masaka, Mbarara and Kabale are sending a weekly list of estimated quantities of each vegetable variety required during the following week to the manager in Kigezi. This list of estimates is based on the demand situation at the time of submission of the requirement sheet. The manager in Kigezi uses the requirement sheets for calculating the purchasing quota per Primary Society according to:

- membership of the Society,
- characteristics of the particular production area.

The purchasing quota are submitted to the Primary Society committee on the previous market day in order to be able to give notice of the market trend to the members early enough to take the necessary steps for delivery. Supplies of vegetables in great demand is encouraged.

This marketing information system which was found to be the only possible way of handling the demand situation within the Union set-up requires one week until it has reached the last farmer due to the slow communication link between Primary Society and indivi-

dual grower which still takes about 3 days. Thus the vegetables in practice are delivered in accordance with the demand of the previous week. Good statistical data and reliable information by the extension staff are further means to reduce possible excess buying by the Primary Societies. If oversupply is expected the committee of the Primary Society has two ways of solving the problem:

- to buy from each member only a certain amount of the vegetable in question,
- to buy the whole graded production of the oversupplied vegetable but at a lower producer price so that the expected amount of money paid by the Union for the restricted quota will pay for the purchase of all products delivered by the growers.

Excess vegetables remaining at the Society store are usually sold to special traders delivering areas (Kilembe Mines, Fort Portal). The Union has no marketing organization of its own due to transport difficulties. Some Societies decided as well to distribute the remaining vegetables to the poor and old people of the area free of charge.

d. HOME CONSUMPTION OF VEGETABLES

The traditional consumption of indigenous vegetables positively stimulated the adoption of newly introduced vegetables into the farmers' meals. As CREMER mentions the farmers in Kigezi were enumerating exotic vegetables they used far more proudly than their traditional indigenous vegetables[1]. All vegetables are preferably eaten cooked, even lettuce. This observation coincides with RICHARDS' findings in Rhodesia[2]. Of the 17 vegetables used, cauliflower tops the list. Taking into account the high percentage of carrots eaten raw this rootcrop

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1) H.D. CREMER: Verbesserung der Ernährungssituation in Ostafrika, Stuttgart 1966, P.38.

2) A.I. RICHARDS: Land, Labour and Diet in Northern Rhodesia. Oxford 1939, p.53.

has to be regarded as the most commonly consumed vegetable (ca. 40 per cent). There is a direct correlation between popularity in consumption of certain vegetables and occurrence of overproduction. In 1965 the situation was different. The majority of the farmers, often producing vegetables for more than ten years had not yet tasted most of the vegetables, except cabbage, tomato and onion.

As one of the additional functions of the Vegetable Scheme was to aim at the improvement of the local people's diet in the densely populated parts of South-Kigezi and the newly introduced grading system left the second grade products with the farmers, the extension service started attempts to stimulate home consumption of vegetables in 1965. The following points served as a guideline for instruction:

- To argument and advise only in the growers' simple language. Definitions like vitamins or minerals were not used, but reasons were given e.g.: The carrot contains a certain medicine which helps the eyes to become good and the skin to be smooth and beautiful (for women), or cauliflower helps your children to become good at school because eating it helps the brain, etc.
- When explaining in the field the extension staff tastes the raw vegetables themselves. It was found that the practised order was most successful: At first the extension worker would take e.g. radish and eat it in front of the watching growers. Then he would offer a radish to the chairman and the committee members present, who could hardly refuse to taste one, thus proving the watching members that there is nothing harmful about this vegetable. By this demonstration the barrier of caution can be overcome resulting at least in the tasting of the product.
- To offer farmers attending a course at the District Farm Institute daily properly prepared vegetables, especially newly introduced kinds, with their meals.

By these methods the inclusion of vegetables in the diet increased, reducing actual wastage and although it could not be completely proved within this investigation, one may presume that the nutritive standard of the diet has been improved as well. This process is already so far advanced that e.g. carrots have to be grown as close to the house as possible because they top the list of the field thefts being the herdboys favourite titbit.

3. MARKETING OF VEGETABLES

a. TASKS AND ORGANIZATION OF THE KIGEZI DISTRICT VEGETABLE GROWERS CO-OPERATIVE UNION LTD.

The task of the Vegetable Union is: "... to do something they cannot very well do as individuals..."[1], namely to market the vegetables grown in Kigezi. Figure 1 as well as tables 85 and 86 illustrate the development of this task.

The Vegetable Union is therefore maintaining:

- one office in Kigata/Kigezi 6.4 km from Kabale
- one wholesale depot and office in Kampala
- one retail shop in Kampala
- one market stand in Masaka
- one retail store in Mbarara
- one market stand in Kabale.

The Union was repeatedly forced to train new managers and staff. While the farmers in Kigezi become more and more used to adopting themselves to production problems the main handicap of the Union remains: to find suitable staff able to handle the marketing end[2]. It has to be noted that

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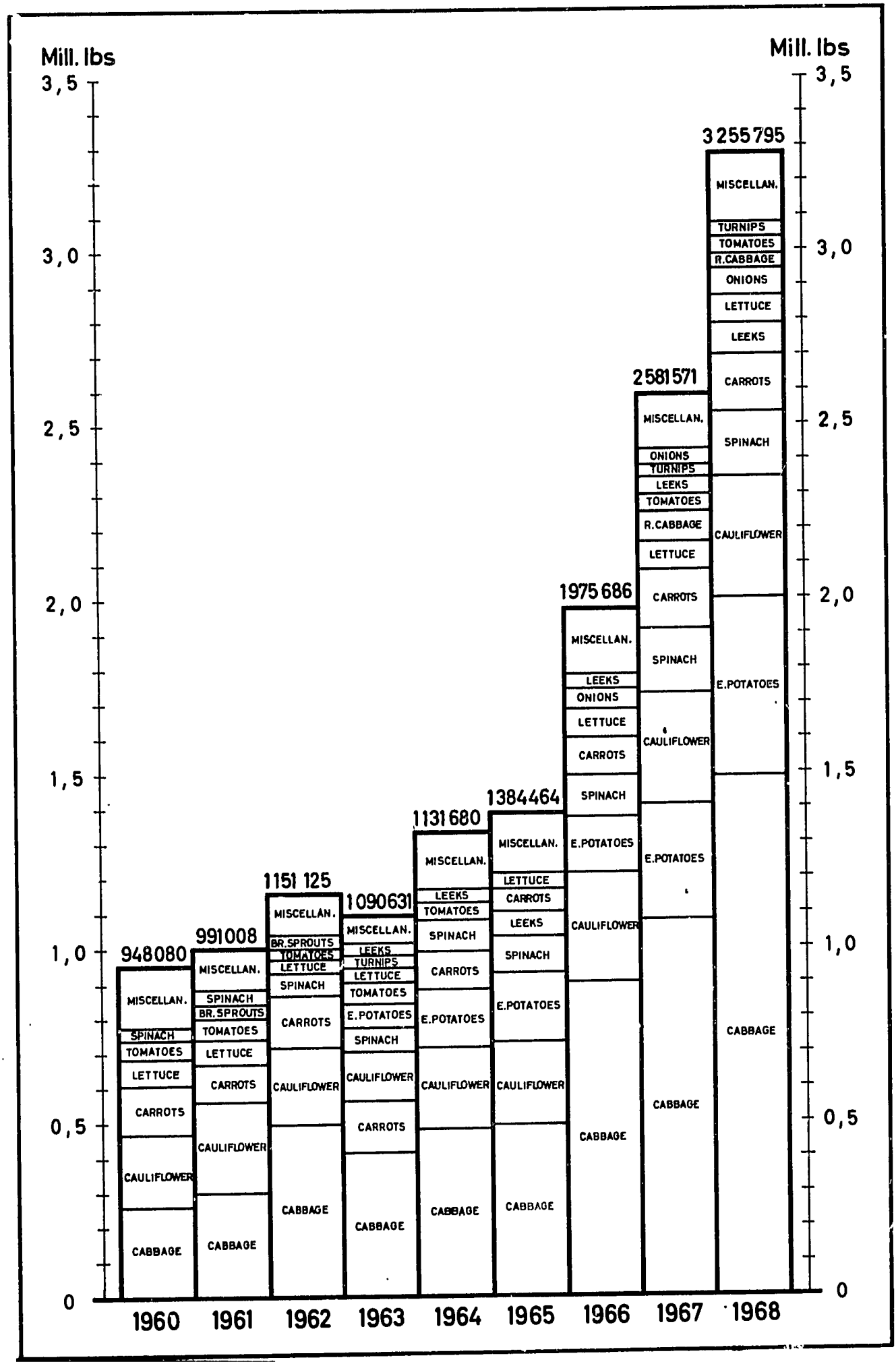
1) A.F. LAIDLAW: Loc.cit., p.1. P. TRAPPE: Loc.cit., p.10. G. SCHACK, A. FEINEISEN: The German Raiffeisen Organisation, Deutscher Raiffeisen Verband e.V., Bonn.

2) J. BÜSE, J. HEIDERMANN: Loc.cit., p.62.

Figure 1: Annual Vegetable Purchases by the Kigezi Vegetable Union 1960 – 1968 in lbs



dealing with perishable products such as vegetables must be regarded as one of the most difficult trades.

Table 85. The Vegetable Union Staff 1968

Place	Staff
Kigata/Kigezi	1 Manager 3 Clerks 8 Porters 1 Nightwatchman
Kampala	1 Manager 1 Assistant Manager 2 Clerks 1 Driver 3 Porters
Masaka Mbarara Kabale	1 Sales Assistant 1 Sales Assistant 1 Sales Assistant

Source: UG.GOV.: District Files, Kigezi.

Since 1965 the Agricultural Officer, Vegetable in Kigezi trained five managers at Kampala:

- the first manager resigned after being trained abroad, starting his own business,
- the second manager turned out to be a drunkard,
- the third manager became Trade Officer, after having been trained within the Vegetable Union for one year,
- the fourth manager had to be sacked due to irregularities,
- the fifth manager is the former secretary of the Union who started to learn his new job when the previous one had to be sacked.

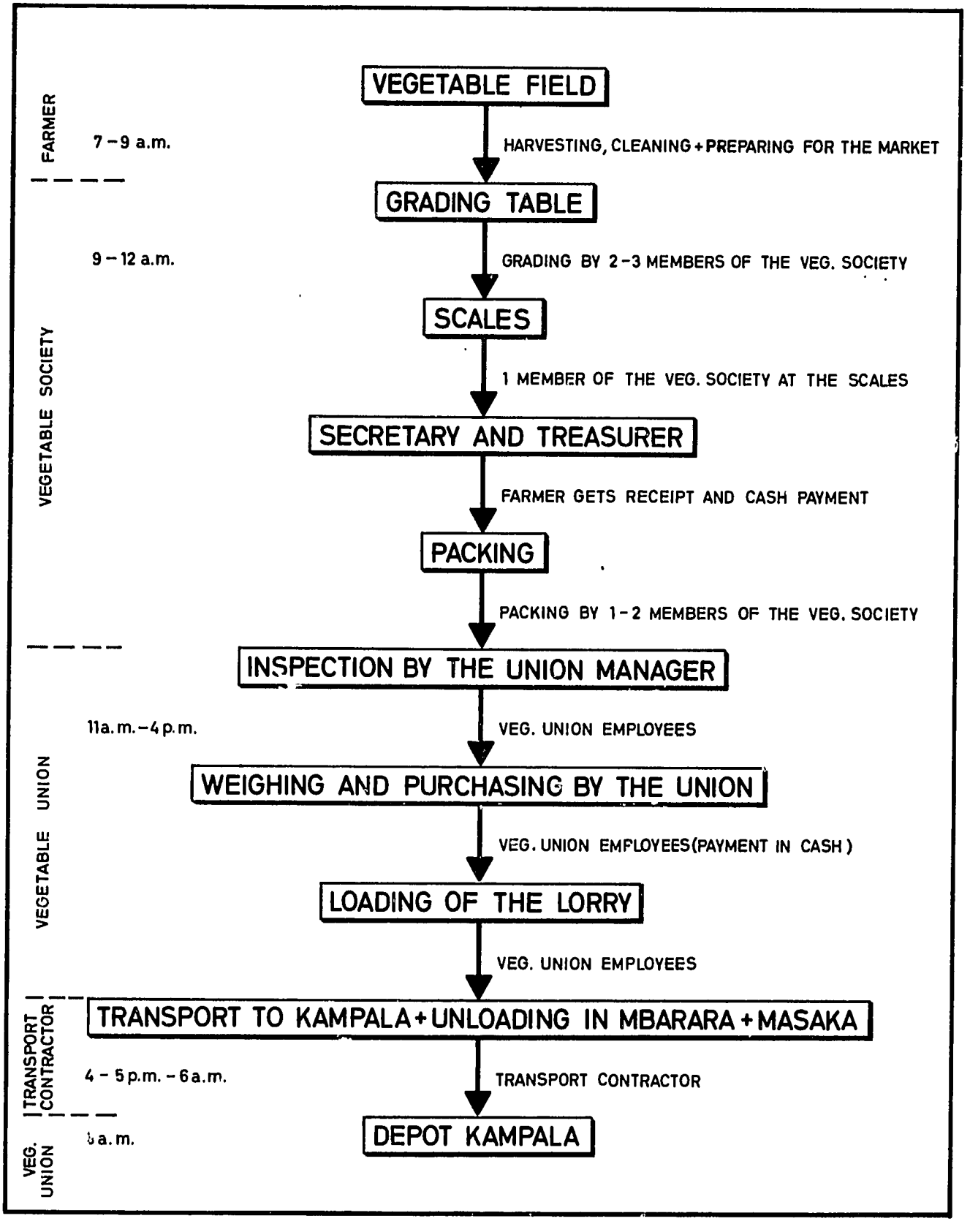
In general the Union's staff policy was based on the selection of school dropouts, who were trained and proved to be more dependable on the job than other employees with the possibility of joining better paying agencies after training. The managerial aspect within the Union set-up is still not satisfactorily solved.

Table 86. Monthly Vegetable Purchases by the Vegetable Union from the Primary Societies in lbs. and Shs., 1965 - 1968

Month	1965 Purchases lbs	1966 Purchases lbs	1966 Increase lbs	1966 Increase %	1967 Purchases lbs	1967 Increase lbs	1967 Increase %	1968 Purchases lbs	1968 Increase lbs	1968 Increase %
Jan.	96,341	167,605	71,264	73.9	203,088	35,483	21.2	245,151	42,063	20.7
Feb.	98,186	172,796	74,610	75.9	213,012	40,216	23.2	283,344	70,332	33.0
Mar.	144,867	165,180	20,313	14.0	246,415	81,235	49.1	278,293	31,878	12.9
Apr.	120,828	125,770	4,942	4.1	210,021	84,251	68.1	263,239	53,218	25.3
May	110,961	131,502	20,541	18.5	221,282	89,780	68.3	231,703	10,421	4.7
June	83,970	187,577	103,607	123.0	205,667	13,090	12.6	207,089	1,422	0.7
July	91,860	167,656	75,796	82.5	228,454	60,798	32.9	308,080	79,626	34.9
Aug.	123,670	173,534	49,864	40.3	231,831	58,297	29.9	310,720	78,889	34.0
Sep.	130,488	168,548	38,060	29.0	184,944	16,396	7.9	293,136	108,192	58.4
Oct.	105,638	146,549	40,911	38.7	220,406	73,857	50.6	330,640	110,234	50.0
Nov.	127,554	165,163	37,609	30.2	228,530	63,367	38.4	271,576	43,046	18.8
Dec.	150,101	203,806	53,705	35.8	187,921	-15,885	-7.9	232,824	44,903	23.8
Total	1384,464	1975 686	591,222	42.7	2581,571	605,885	30.7	3255,795	674,224	26.1
	Shs	Shs	Shs	%	Shs	Shs	%	Shs	Shs	%
Jan.	12,000	19,940	7,940	66.2	22,905	2,965	14.8	28,278	5,373	23.4
Feb.	13,000	19,783	6,783	52.2	24,301	4,518	22.8	31,775	7,474	30.8
Mar.	18,359	16,226	-2,133	-11.6	25,426	9,200	56.7	29,459	4,033	15.5
Apr.	16,149	11,799	-4,350	-26.9	24,429	12,630	107.4	27,461	3,032	12.8
May	17,410	12,938	-4,472	-25.7	24,477	11,539	89.2	22,976	-1,501	-6.1
June	11,744	22,099	10,355	88.2	20,552	-1,547	-7.0	23,643	3,091	15.0
July	13,830	21,337	7,507	54.3	24,809	3,472	16.3	35,090	10,281	41.4
Aug.	19,852	20,186	334	1.7	23,765	3,579	12.8	34,762	10,997	46.2
Sep.	14,368	16,241	1,873	13.0	20,263	4,022	22.3	33,458	13,195	65.1
Oct.	10,818	13,514	2,696	24.8	22,557	9,043	67.0	34,933	12,376	54.8
Nov.	15,159	17,482	2,323	15.3	19,408	1,926	11.0	29,263	9,855	50.7
Dec.	17,028	23,011	5,983	35.1	17,858	-5,153	-22.4	21,356	3,498	15.5
Total	179,717	214,556	34,839	19.3	270,750	56,194	26.2	352,454	81,704	30.1

Source: UG.GOV.: District Files, Kigezi.

Figure 2: Stages the Vegetables are Passing on their Way from the Field to the Union Depot in Kampala



The Union committee decides on assigning individual employees and determines their particular tasks. It is, however, amazing that the Union was able to expand the business in such a rapid way under the existing circumstances on the staff side. A further obstacle is the inexperience of committee members. Within the last three years 25 committee members had to be trained to understand at least the fundamental thinking and rules in the delicate trade. Most of them had no trading experience and had never seen Kampala before.

Table 87. Kigezi Vegetable Union Costs (Extract from the Balance Sheets 1965-1967) in Shs.

Costs	Vegetable Society 1964/65	Vegetable Union 1965/66	Vegetable Union 1966/67
Vegetable Purchases	207,525.67	242,444.60	281,709.25
Wages	9,245.30	10,230.50	11,176.70
Packing Material	25,843.85	21,084.90	23,257.40
Transport	64,507.70	62,577.60	69,187.10
Losses	330.50	806.90	988.75
Travelling Allowances	370.65	271.75	399.80
Bad Debts	489.75	7,136.33	-
Salaries	17,825.20	10,607.05	22,675.40
Depreciation	241.60	4,688.55	4,676.14
Committee Allowances	3,000.30	4,011.30	3,602.45
Office material	2,522.15	4,869.10	-
Bank charges	702.95	623.70	786.90
Telephone charges	1,755.70	1,056.4[illegible]	2,036.70
Insurance	349.30	-	450.00
Repairs	235.00	411.00	428.40
Water, Rents	-	1,375.00	3,770.15
Account control	531.00	204.00	204.00
Entertainments	520.30	518.20	147.50
Transport Kampala	4,617.95	5,392.85	12,339.70
Gifts	-	100.00	-
Fines	-	20.00	-
Total Costs	337,914.87	378,129.79	438,136,34
Sales	329,153.04	388,569.97	457,253.85
Profit	-	12,302.25	22,985.26
Loss	8,557.03	-	-

Source: UG.GOV.: District Files, Kigezi.

b. **PACKING OF VEGETABLES**

Within the Vegetable Union four types of packing material are used:

- bundled products (Celery, kale, leek, swiss chard, spinach, parsley, rhubarb),
- products in sacks (Bean French, broad bean, pea (all only if in dry condition), fennel, cucumber, potato, kohlrabi, carrot, parsnip, beetroot, turnip, onion),
- products in crates (Artichoke, cauliflower, eggplant, lettuce, radish, capsicum, brussel sprouts, tomato, bean french, broad bean and pea if wet),
- products transported open in the lorry (Cabbage white and red).

For bundling farmers use traditional binding material like banana fibre and papyrus ropes. The sacks are bought in Kampala (good second hand quality) for Shs. 1.30 to 2.00 per sack (average Shs. 1.50 to 1.70).

At the market the farmers deliver the vegetables to the committee member in charge of packing after they have been graded and bought. The products are immediately packed or piled up. The floor has to be covered with papyrus carpets.

c. **TRANSPORT OF THE VEGETABLES**

At present the Vegetable Union is sending four lorry loads per week to its distribution centres in Mbarara, Masaka and Kampala. These transports are subject to transport contracts with two Kigezi firms. As these transporters are mainly transporting goods from Kampala to Kigezi space in the lorries is usually not fully used on the Kigezi-Kampala route and lorry owners are keen to secure a contract. As a result the Kigezi Vegetable Union is in an advantageous position to get a lorry on a one way basis only. At the same time it is able to impose very

strict contract terms. This situation makes it unnecessary to provide the Union with its own transport facilities to Kampala. At present the lorry is rented for Shs 500.00 per route. For this amount the contractor accepts:

- To supply lorries of not less than 400 cubic feet each in good running order and clean condition exactly at such a time as may be required by the Union (9.00 a.m. of the market day).
- To bring back without additional charge all empty crates, gunny bags etc. as used by the Union for packing vegetables.
- To allow a committee member to accompany vegetables to Kampala free of charge.
- To ensure that nothing else but vegetables are put in the lorry and that neither he himself nor his employees sell fruits and vegetables on their own account.
- To deliver the vegetables in good condition to the depots in Mbarara and Masaka and to reach the Kampala depot until 6.00 a.m. on the next morning after the market day.
- To be responsible for any loss or spoiled products caused during transport or for costs arising for the Union if the lorry is not in time (except higher circumstances).
- The insurance of the consignment is the contractors responsibility.

Estimates reveal that if the Vegetable Union would buy its own transport facilities at least two lorries would be needed. Apart from staff and organisation problems the Union would lack return load from Kampala to Kigezi as there are already too many lorries stationed in Kabale. In addition the Union lorries could not afford long waiting times at the Kampala end. Summarizing, the Union with Shs 2.00 per mile running costs would have transport overheads of Shs 1,000.00 per trip, thus increasing its present transport costs by 100 per cent.

For deliveries within Kampala the Union bought in 1966 a VW pick-up. At the other places the sales assistant rents a pick-up if need arises.

At the end of the market days in Kigezi the contractor provides a pick-up for transporting the staff back to Kigata as well as vegetables to the Kabale market stand.

d. SALES ORGANISATION

As already mentioned, the Kigezi Vegetable Union uses the following sales centres:

- 1 wholesale depot in Kampala since 1961
- 1 retail shop in Kampala since 1968
- 1 market stall in Masaka since 1966
- 1 retail store in Mbarara since 1967
- 1 market stall in Kabale since 1965.

The amount of vegetables (excluding potato sol.) grown within the Kigezi Vegetable Scheme but handled outside the Kigezi Vegetable Union has been estimated at 300,000 to 400,000 lbs in 1968. This is 10 to 15 per cent of the quantity purchased by the Vegetable Union[1]. Independent traders buying in Kigezi and transporting to Kilembe Mines, Fort Portal, schools in North-Kigezi, etc. are in certain cases welcome at times of overproduction when restrictions have to be applied by the Union. During periods of shortages, mainly in Buganda, considerable amounts are sent through private channels as taxi, bus and lorry divers, etc. The Kigezi Vegetable Co-operatives have not got a monopoly in handling vegetables and cannot undertake legal actions against this trade which very often seriously damages the Union's good name since mostly second grade products are sold under the label of Kigezi Vegetables. Some traders even advise farmers to grow vegetables and supply them with seed, regardless of the market situation existing when

1) Estimates by the Extension Service of the Vegetable Scheme.

the products will be ready. Usually the trader does not turn up and the grower tries to supply his production to the Primary Society causing oversupplies. The only possible action left to the co-operatives is to threaten and fine members who are found selling vegetables outside their Society. In practice this proves to be a difficult task.

In March 1969 the Minister of Marketing and Co-operatives declared under the Produce Marketing Board Act of 1968 vegetables as controlled produce. This menas that in future each trader dealing with vegetables has to be in possession of a license issued by the Produce Marketing Board. This may assist the Kigezi Vegetable Union in solving the problems mentioned above.

Table 88. Annual Deliveries to the Different Market Places 1965 - 1968

Place	Vegetable Deliveries in lb. 1965	%	1966	%	1967	%	1968	%
Kabale	98,119	8.3	144,444	7.3	100,319	3.9	146,693	3.9
Mbarara	27,392	1.9	36,551	1.9	89,669	3.8	236,301	7.1
Masaka	38,405	2.7	129,104	6.5	146,185	5.6	204,843	6.7
Kampala	1,220,612		1,665,495		2,245,398		2,666,096	
		87.1		84.3		86.7		82.3
Total	1,384,528		1,975,594		2,581,571		3,253,993	

Source: UG.GOV.: District Files, Kigezi

Table 89. Monthly Deliveries to the Different Market Place during 1968 in lb.

Month	Kampala	Masaka	Mbarara	Kabale
January	207,897	12,038	13,609	11,607
February	245,609	15,966	11,459	10,310
March	236,146	18,122	14,723	9,302
April	224,295	15,649	14,190	9,105
May	188,260	17,836	15,030	10,577
June	172,556	11,720	12,951	9,862
July	258,803	17,127	18,303	13,847
August	247,952	16,584	24,358	11,826
September	228,045	21,919	27,082	16,090
October	249,824	26,073	31,748	16,472
November	196,061	16,496	29,703	14,226
December	210,648	13,313	23,145	13,469
Total	2,666,096	204,843	236,301	146,693
	82.3%	6.7%	7.1%	3.9%

Source: UG.GOV.: District Files, Kigezi.

e. FORMS OF SALES

Kigezi Vegetables are reaching customers over three different kinds of sales:

- tender contracts: approx. 50 to 60 per cent
- wholesale: approx. 20 to 30 per cent
- retail: approx. 10 to 20 per cent.

Tender Contracts

The supply of tender contracts such as schools, colleges, hospitals, prisons, army and hotels is the backbone of the Kigezi Vegetable Union business.

Table 90. Development of the Tender Contracts of the Kigezi Vegetable Union and Its Predecessor 1961 - 1968

Year	Number of Contracts	Increase
1961	28	-
1962	28	0
1963	33	5
1964	40	7
1965	57	17
1966	66	9
1967	83	17
1968	96	13

Source: UG.GOV.: District Files, Kigezi.

There is a high share of school tenders, but the schools being closed at certain times of the year are causing problems in vegetable marketing during the time of:

- end of December until mid January
- after Easter until May
- August and September.

Table 91 gives the tenders within the area of action of the Kigezi Vegetable Union and the approximate amounts being delivered by the Union. The example of the development of vegetable consumption of a big institution is illustrated by Table 92.

Table 91. Tenders within the Kigezi Vegetable Union's Area of Action, 1968 in lbs

Vegetable Variety	Central Tender Board	National Teacher College	Makerere University College	Uganda Technical College	College of Commerce	Army Mbarara	Ankole Tenders	Uganda Hotels
Cauliflower	30,500x	-	-	1,000x	-	-	-	-
Bean French	4,350x	-	-	-	-	-	-	-
Eggplant	4,500	-	-	-	-	-	-	-
Pea	5,700	-	-	-	-	-	-	-
Kale	-	-	-	600x	-	-	-	-
Cucumber	1,000	-	-	-	-	-	-	-
Potato sol.	236,000x	78,000	810,000	10,000	300,000	-	2,058x	6,000x
Lettuce	3,300x	-	-	-	-	-	-	-
Marrow	12,000	-	-	4,000	-	-	-	-
Swiss Chard	42,200x	-	-	-	15,000x	-	-	-
Carrot	43,600x	-	-	10,200x	-	-	-	-
Okra	1,000	-	-	-	-	-	-	-
Beetroot	500x	-	-	2,000x	-	-	-	-
Spring Onion	1,200	-	-	-	-	-	-	-
Turnip	800x	-	-	-	-	-	-	-
Tomato	71,500x	3,330	26,700	24,000	20,000	-	-	-
Cabbage	1,188,050x	-	-	16,000x	8,000x	-	2,400x	-
Onion	112,450x	38,000	41,900	6,000	4,480	12,000x	2,686x	3,000x
Mixed Vegetables	-	46,620x	355,700a)	-	-	102,480x	250,269a)	4,000x
Total	1,759,550	165,950	1,234,300	73,800	347,480	114,480	257,415	13,000

a) Parts of the tender delivered by the Kigezi Vegetable Union.

x) Vegetables supplied by the Kigezi Vegetable Union.

Source: UGANDA GAZETTE: Tender Publications 1968.

Table 92. Development of the Vegetable Tenders of Mulago Hospital 1962 - 1967 in lbs

Vegetable Variety	1962	1963	1964	1965	1966	1967
Cauliflower	12,000	45,000	18,500	8,700	40,000	30,000
Bean French	-	4,500	5,500	10,000	20,000	4,000
Eggplant	-	-	-	-	6,000	4,500
Pea	14,000	-	-	-	10,000	5,000
Cucumber	-	-	-	-	-	1,000
Potato sol.	75,500	90,000	95,000	126,000	55,000	100,000
Lettuce	-	-	500	3,000	720	1,300
Marrow	12,000	-	-	-	1,500	2,000
Swiss Chard	10,000	22,500	13,000	5,100	47,000	35,500
Carrot	25,000	3,500	3,000	5,300	18,000	28,000
Okra	-	-	-	-	5,000	1,000
Beetroot	-	1,000	1,100	900	500	500
Spring Onion	-	-	-	-	-	1,200
Turnip	-	-	-	-	500	500
Tomato	1,200	5,500	25,000	8,600	22,000	50,000
Cabbage	25,000	23,000	67,000	10,000	58,000	30,000
Onion	15,500	16,500	16,500	20,000	30,000	30,000
Total Vegetables	191,200	211,500	245,100	197,600	314,220	324,500

Source: UGANDA GAZETTE: 1962 - 1967.

The Wholesale Trade

Wholesale partners of the Kigezi Vegetable Union are:

- retailers
- market stall owners
- institutions, schools and hotels not supplied on tender contracts.

Approximately 50 per cent of the wholesale trade is handled by market stall owners. The large part played by those customers is influencing to a certain degree the layout of the main depot in Kampala and the way products are handled there. It seems to be an ingrained habit of these market dealers to first touch any product they purchase and to choose what they think best for the price agreed. Attempts to change these habits provided the following results:

- Painting and stressing of cleanliness already caused a slight drop in sales,
- The attempt to hand out required products over a counter met enraged rejection. Most of the customers did not buy any vegetables then and left the depot under protest.

The Kigezi Vegetable Union had to choose between the alternatives of:

- Abandonning a good business with this group of dealers to spare wastage caused by this type of individual selection and create a proper vegetable wholesale atmosphere in its place,
- Complying with their habits and putting up with the higher wastage covering it with higher and guaranteed sales and trying to change them gradually.

The Union accepted the latter way since its position is not yet strong enough and the farmers in Kigezi depend on every customer.

The Retail Trade

Since 1965 the Vegetable Union started to pay more attention to the retail trade. The Market stalls in Kabale and Masaka and the retail shops in Kampala and Mbarara are the first results.

As only a few of the local vegetables are suited to conditions of mass production, transport, storage and consumption in big institutions and urban areas appropriate vegetable types are taking their place in the diet of inhabitants in big towns, schools, hospitals, etc. So far the part of the population prevalently consisting of expatriates and Asian consumers has been adequately served by Asian and European traders, purchasing vegetables in wholesale from the Kigezi Vegetable Union. These dealers will go on catering for the higher income group of consumers by offering better serice for higher prices. The actual mass of the African population is provided with vegetable only by local markets and hawkers.

The Kigezi Vegetable Union being an all African enterprise must have the primary aim of serving the African population and creating or improving demand by an appropriate price policy as its long-term policy. Therefore, the chosen site of the retail shop in Kampala is located in the lower rent area with African population. This policy allows the Union staff to gain experience in the difficult task of retail service one of the weak points of African enterprises in their competition with the established Asian traders. Once the Union has enough experience it will be less risky to enter premises in the expensive streets (Shs. 3,000.-- per month in the main streets of Kampala). The Union started to sell local African vegetables and baskets in the shop. However, it was found that local vegetables e.g. doodo grown in Kigezi did not fit the Buganda taste. Climate and altitude conditions obviously influence the constitution of these types of vegetables.

Table 93 shows the cost structure of a retail shop under African management in the lower rent area of Kampala at a sales volume of Shs 2,500,-- per month.

Table 93. Cost Structure of a Vegetable Retail Shop in Kampala (Turnover Shs 2,500,-- per Month)

Expenditure	per cent of the total costs
Vegetables	52 %
Wastage	20 %
Store Rent	9 %
Labour Costs	7 %
Furniture etc.	2 %
Profit	10 %
	100 %

Source: Calculations of the Vegetable Store in Kampala.

f. MARKETING COSTS

The remoteness from the main market outlets causes high transport costs for products from Kigezi. Thus transport costs take the highest share in the marketing costs of Kigezi vegetables.

Table 94. Expenses of the Kigezi Vegetable Union in Shs/lb

Costs	Shs/lb
Marketing Costs (including transport costs of Shs 0.04/lb	0.08
Wastage	0.03
Vegetable purchases	0.10
Total Costs	0.21

Source: UG.GOV.: District Files, Kigezi.

Table 95. Development of the Marketing Costs of the Kigezi Vegetable Union and its Predecessor in per cent 1959 - 1967

Costs	1959/0 % a)	1961/2 %	1962/3 %	1964/5 %	1965/6 %	1966/7 %
Vegetable Purchases	49.1	50.3	53.1	61.4	64.4	64.3
Wages	5.7	3.1	2.8	2.7	2.7	2.6
Packing Material	5.1	11.2	8.2	7.6	5.5	5.3
Transport Costs	30.1	24.3	26.9	19.1	16.5	15.8
Transport Kampala	-	-	-	1.2	1.1	3.0
Losses	0.2	0.3	0.1	0.1	0.2	0.2
Travelling Allowances	2.3	0.7	0.4	0.1	0.1	0.1
Bad Debts	0.2	1.0	-	0.1	1.8	-
Salaries	5.4	4.8	4.1	5.2	2.8	5.2
Depreciation	1.0	0.1	.	0.1	1.3	1.1
Committee Allownaces	-	2.1	2.2	0.8	1.2	0.9
Office Material	-	0.8	0.7	0.7	1.3	.
Bank Charges	-	0.4	0.3	0.2	0.1	0.2
Telephone	-	0.5	0.4	0.5	0.3	0.5
Insurance	-	0.2	0.2	0.1	0.1	0.1
Repairs	-	.	.	.	0.1	0.1
Water and Rents	0.7	0.2	.	.	0.3	0.9
Account control	-	.	0.6	0.1	0.1	.
Entertainment	-	-	.	.	0.1	.
Fines and Gifts	-	-	-	-	.	-

a) Kigezi Industries Ltd.

Note: . = Amounts less than 0.1 %

Source: UG.GOV.: District Files, Kigezi.

Table 96. Percentage of Wastage and Weight Losses of Vegetables Marketed by the Kampala Depot of the Kigezi Vegetable Union, 1967/68

Year	Month	Wastage and Weight Losses in %
1967	August	28.0
	September	12.6
	October	24.2
	November	34.0
	December	21.4
1968	January	27.1
	February	23.2
	March	24.1
	April	33.3
	May	25.0
	June	25.6
	July	33.3
Average for 12 Months		25.9 %

g. VEGETABLE MARKET PRICES

The Price Policy of the Kigezi Vegetable Union

The Kigezi Vegetable Union is seriously handicapped in its price policy by the high fixed cost due to the remoteness to the market. The guidelines of the Union's price policy are the principles of co-operative marketing:

- to ensure the members the highest possible price,
- to market large quantities of vegetables, to provide more cash income to a greater number of farmers,
- to adjust prices to those of the competitors,
- to influence the vegetable prices in Uganda as a whole by a price policy which keeps competetiveness with any other potential growing area as keen as possible.

The axiomatic rule of the Kigezi Vegetable Union is to sell vegetables consumed by the African population at price costs level (depending at times of the season and the market situation) with the aim to encourage consumption and develop a future market. Profit gained from sales of vegetable types asked by the higher income groups are often subsidizing these profit forfeitures or losses, e.g. vegetables such as cauliflower, celery, artichokes, brussel sprouts, etc. usually carry a profit margin while vegetables such as cabbage white, carrot, turnip, swiss chard, etc. are often sold below cost price.

The Kigezi Vegetable Scheme was introduced in 1951 to provide a cash resource for farmers in South-Kigezi. In 1969 the Kigezi Vegetable Union still faces this task in its price policy, compared to other areas in Uganda as no big scale crop has yet been found providing an adequate cash income.

The competition for Kigezi vegetables recruits from local growers around marketing centres and imports from Kenya. Serious consequences for the Kigezi vegetable growers arise from

the character of Kenya imports. These imports are channelled over the market stall keepers mostly originating from Kenya, or over Asian retailers who often own estates in Kenya or have their main office in this neighbouring country. These traditional or family links are inducing those vegetable dealers to favour Kenya products regardless of the profit margin. In regard to the local production near to consumer centres the Kigezi vegetable growers depending on the income from vegetables, have to apply a price policy which makes vegetable growing not too attractive in comparison to other cash crops as coffee, cotton, plantain, etc. these near to the market farmers are planting at present.

Market Prices

The tender prices represent the basis for Kigezi vegetable prices. Daily demand and supply are influencing these basic market prices. The following tables 97 to 99 give a picture of the development of vegetable market prices of the Kigezi Vegetable Union.

Table 97. Development of Tender Prices of the Kigezi Vegetable Union, 1961 - 1968 in Shs. per lb.

Vegetable	1961	1963	1964	1965	1967	1968
Bean French	-	0.20	-	-	0.30	0.30
Beetroot	0.25	0.25	0.25	0.25	0.25	0.30
Bruss.Sprout	0.45	-	-	-	0.45	0.45
Cabbage White	0.23	0.23	0.20	0.20	0.20	0.20
Carrot	0.25	0.25	0.25	0.25	0.20	0.20
Cauliflower	0.45	0.45	0.45	0.45	0.45	0.45
Celery	-	-	-	-	0.40	0.40
Kale	-	-	-	-	-	0.20
Kohlrabi	-	-	-	-	-	0.25
Leek	-	-	-	-	0.30	0.30
Lettuce (head)	0.30	-	0.20	0.20	0.25	0.30
Onion	0.45	0.40	0.40	0.40	0.45	0.45
Parsley	-	-	-	-	0.30	0.30
Parsnip	-	-	-	-	0.30	0.30
Potato sol.	-	-	0.23	0.23	0.23	0.23
Radish (bundle)	-	-	-	-	-	0.10
Swiss Chard	0.20	0.20	0.20	0.20	0.20	0.20
Tomato	0.55	0.50	0.40	0.40	0.40	0.40
Turnip	0.20	0.30	0.20	0.20	0.20	0.20

Source: UG.GOV.: District Files, Kigezi.

Table 98. Vegetable Prices in Kampala in cents per lb. of the Kigezi Vegetable Union 1961, 1965 - 1968

Vegetable Variety	1961	1965	1966	1967	1968
Artichoke	20 - 30	30 - 40	30	20 - 30	20 - 30
Bean French	30	30	15 - 30	30 - 50	20 - 50
Beetroot	30	30	30	30	20 - 40
Bean Broad	30	20 - 30	25 - 35	30	20 - 30
Brussel Sprouts	50	50	50 - 60	30 - 70	30 - 70
Cabbage White	10 - 20	8 - 25	5 - 25	8 - 25	8 - 20
Cabbage Red	-	-	30	20 - 30	15 - 30
Capsicum	30	30	30	30 - 40	20 - 40
Carrot	30	20 - 30	15 - 30	20 - 60	12 - 40
Cauliflower	40 - 50	30 - 80	40 - 50	50 - 70	30 - 70
Celery	50	40 - 50	30 - 60	50 - 70	30 - 70
Cucumber	-	-	-	30 - 50	30 - 50
Eggplant	-	-	-	70	30 - 60
Fennel	-	-	20 - 30	30	20 - 30
Kale	-	-	-	20 - 30	10 - 30
Kohlrabi	-	-	-	20 - 30	10 - 30
Leek	30	25 - 30	30 - 35	25 - 40	20 - 40
Lettuce (Head)	30 - 40	20 - 40	30 - 50	30 - 70	20 - 70
Parsley	-	-	20 - 50	25 - 60	20 - 50
Parsnip	40 - 50	30 - 40	30	30	30
Pea	60	30- 40	40 - 60	40 - 60	30 - 70
Potato sol.	15 - 20	20 - 25	20 - 25	20 - 30	20 - 30
Onion	50	40 - 50	35 - 60	40 -150	45 -100
Radish (Bunch)	-	10 - 30	10	10 - 30	10 - 30
Rhubarb	-	30	30	30 - 35	20 - 40
Sweet Corn	-	10	30	10	10 - 20
Swiss Chard	20 - 30	15 - 20	20 - 30	20 - 30	10 - 30
Tomato	30 - 50	30 - 50	20 - 40	35 - 70	30 - 60
Turnip	20	20 - 30	20 - 30	20 - 30	10 - 30

Source: UG.GOV.: District Files, Kigezi.

Table 99. Differentiation of Tender Prices between Kabale, Mbarara, Masaka and Kampala, in Shs. per lb. 1967

Vegetable	Kabale	Mbarara	Masaka	Kampala
Cabbage White	15	18	20	20
Swiss Chard	15	18	20	20
Potato sol.	20	20	20	23

Source: UG.GOV.: District Files, Kigezi.

h. FACTORS INFLUENCING THE MARKET FOR KIGEZI VEGETABLE

The influencing factors in the marketing of vegetables from the Kigezi Vegetable Scheme are[1]:

- production
- competitors
- consumers
- advertising.

The Production

The natural climatic influences on vegetable production in South-Kigezi cannot be eliminated under the existing methods of cultivation. Adequate measures of cultivation methods variety and habitat selection may reduce these influences. A typical example for seasonal production are French Beans. Aphid and bean fly attacks during certain periods of the year can hardly be controlled within the scope of economical pest control for a Kigezi vegetable grower. Improvements can still be achieved in regard to succession planting diversification of vegetable varieties and quality by continuing extension work.

Farmers are willing to put advice given into practice once they trust their advisors. This they proved by overcoming the production bottleneck during the dry season between June and August which until 1965 was accepted as a natural fact. Due to accepting increased vegetable growing along rivers and

1) FAO: Marketing Fruit and Vegetables, Rome 1957, p.132.

swamps carried out at the right time with appropriate cultivation methods this period was facing overproduction in 1968.

Table 100. Vegetable Purchases in the Kigezi Vegetable Scheme between June and August 1963 - 1968 in lbs.

Month	1963	1964	1965	1966	1967	1968
June	49,144	88,348	83,970	187,577	205,667	207,089
July	84,708	98,884	91,860	167,656	228,454	308,080
August	77,051	122,138	123,670	173,534	231,831	300,720

Source: UG.GOV.: District Files, Kigezi.

The production of newly introduced vegetables like radish, kohlrabi, parsley, kale, fennel, rhubarb was put into practice so quickly that after the first harvest, within an average of three months overproduction resulted because of the limited market demand.

The Competitors

The character of the competing traders in the vegetable business mainly in Kampala, with their traditional, personal or business links to the vegetable growing areas in Kenya makes it very difficult for the Kigezi Vegetable Union to enter the market on a purely competitive basis.

An attempt was made to gain some ground by mobilising nationalism (advertising slogan: Remember it is grown in Uganda's soil) and by realizing the country's self reliance policy, and by a competitive price policy. Although the Kigezi Vegetable Scheme has the full support of the Government it frequently encounters unfair competition methods particularly when tendering for big institutions. Difficulties in marketing the Kigezi production arise especially when the Kigezi vegetables coincide with heavy supplies from Buganda or Kenya. The relative inelasticity of the market then results in sudden fall in prices and high percentage of

wastage. These times, of course, vary according to weather conditions:

- for Kenya products: October to February and May,
- for Buganda products: December to January and July to September.

Kigezi vegetables generally find a good market in:

- March and April
- June and July
- Sometimes October and November.

The Consumers

Demand for a product depends widely on its publicity and the traditional consumption habits. The former price policy for vegetables, mainly produced for privileged groups who could afford "European Vegetables", also retarded their introduction.

Rural areas have to be excluded as large scale consumers of non-indigenous vegetables. The housegarden production of local vegetables should be given far more attention by extension staff in charge. One should not overlook the fact that indigenous vegetables have always played an essential and valuable role in the people's diet in most parts of Uganda. Wherever possible those should not be excluded. Even the vegetable growers in Kigezi without exception go on consuming local vegetables to which they naturally give preference.

These sources of local vegetables are only limited in towns because of lack of land and their unsuitability for longer transport hauls and storage. Due to the quantities needed and the perishability of local vegetables big institutions are often unable to consume local vegetables. Here vegetable types which can be grown economically on a big scale, easily transported and stored for a certain period have to step in to ensure the population's supply of minerals and vitamins. When discussing the introduction of non-indigenous vegetable types

the argument stressed is that the African population does not want to adopt these vegetables into their diet. Experiences within the Kigezi Vegetable Scheme area of action have been contradictory:

- The most striking and most comprehensive example were the Kigezi vegetable growers themselves. Even in 1965 a woman would not exchange the usual sweet potato in her child's hand for a carrot even if promised a reward. This situation has been completely changed within three years. But it has to be noted that these results could be achieved only by intensive extension work and continuous examples and not by pamphlets, conferences and sporadic speeches or courses.
- The headmaster of a secondary school in Kigezi always stressed when offered vegetables by the Kigezi Vegetable Union that his students would only accept white cabbage. With the assignment of a new headmaster the vegetable consumption of the same school changed considerably. Cauliflower, carrot, leek, lettuce etc. are now suddenly eaten by the students; of course, the individual's taste is respected by offering a range of different vegetables during the meals.

One phenomenon that must be pointed out is the vegetable consumption in hospitals. Among all institutions the hospitals where dieticians should have good opportunity of having a say in the composition of meals, are not outstanding in higher vegetable consumption. Kabale hospital, e.g., situated in the centre of vegetable growing is feeding its patients mainly on sweet potatoes and dried beans, although it has been proved that the population is including non-indigenous vegetables in their traditional meals. The same comments are relevant also for many schools. From the nutritive point of view hospitals and schools have an important role to play. Here the population or the younger generation can get acquainted with better nutrition. These possibilities have not yet been fully exploited. Nutrition experts and medical staff often concentrate their attention on protein defficiency only, although in many parts of Uganda the natural diet (beans, peas, sorghum) is sufficient and this problem is not so prevalent as in other parts

of the world[1]. The children's nutritive situation has to be judged separately in regard to protein supply.

Thus at present in Uganda paradoxically the poorest farmers of the country are putting in more action and indirect contribution by maintaining low prices and offering new types of vegetables, and achieving better results than institutions designed to improve the nutritive standard of the people. Reasons for this situation are:

- Nutritionalists are often subject to a "protein frency" noticing exclusively protein deficiency and neglecting other fields.
- There are research and reports in plenty but they are rarely succeeded by any actions.

It cannot be expected, of course, that consumer habits are quickly changing. This process and the relevant education will take many years. It is often a matter of generation and education to overcome taboos, tradition and habits.

Advertising

As already mentioned advertisements have mainly to be educational. The Kigezi Vegetable Union is using several types of advertisement:

- Bills are designed to acquaint people with the range of Kigezi vegetables and the Union's sales organisation.
- Advertising pamphlets providing information about "European" vegetables, their preparation and nutritive contents as well as giving a short summary of vegetable growing in Kigezi. During the last Horticultural Show 1968 in Kampala the attention paid by visitors to pamphlets concerning the Kigezi Vegetable Scheme was:
  100 % accepted the advertisement
  75 % were already studying them during the show.

1) J.H. CLEAVE: op.cit., p.81.

- Furnishing shows and exhibitions with Kigezi vegetables. The winning of the first prize for the best commercial stand for three consecutive years in the annual Horticultural Show in Kampala was of great advertisement value.
- Information media such as newspaper, radio, etc. if any opportunity arises to publish information about the Kigezi Vegetable Scheme.

Costs and effects of advertising have to be balanced against one another, since Shs. 1,000 is still a remarkable amount for the Union. Advertisements aiming at the lower income groups cannot be channelled through radio or television. So far the best advertisement for the Kigezi Vegetable Union are good quality at a favourable price in conncetion with adequate and reliable service resulting in advertisement by recommendation.

4. FUTURE MARKETING PROSPECTS FOR THE KIGEZI VEGETABLE SCHEME

a. THE FRESH MARKET

With 3.2 million lbs. of fresh vegetables marketed in 1968 the Union has reached the limit of demand in many vegetables within its area of operation in Uganda. The fresh market only offers small possibilities for expansion (see table 101). Nearly all tenders available are under contract. The number of farmers and estates producing vegetables in areas closer to the market outlets is increasing. This trend will experience intensification caused by the present difficulties in coffee and cotton marketing.

Kigezi will not be able to compete in the cheap bulky or heavy mass products like cabbage, tomato, spinach, lettuce, etc. which with adequate variety selection can guarantee an economical production in the tropical areas around Kampala, etc. The high altitude of Kigezi offers growing advantages for artichoke, celery, cauliflower, pea, potato sol., leek, carrot, etc. The supply of new markets such as

Table 101. Vegetable Production and Estimated Market Demand for Kigezi Vegetables during 1968

Variety	Production 1968 in kg	Demand 1968 in kg	Difference kg +	Difference kg -
Artichoke	820	1,500		680
Bean French	5,968	18,000		12,032
Beetroot	8,777	12,000		3,223
Broad Bean	5,860	7,500		1,640
Bruss.Sprouts	13,126	18,000		4,874
Cabbage White	673,484	672,000	1,484	
Cabbage Red	21,210	12,000	9,210	
Capsicum	3,369	4,800		1,431
Carrot	76,624	90,000		13,376
Cauliflower	155,154	200,000		44,846
Celery	10,038	14,000		3,862
Cucumber	157	2,500		2,343
Eggplant	434	4,000		3,566
Fennel	6,886	1,200	5,686	
Kale	4,868	1,200	3,668	
Kohlrabi	7,493	4,500	2,407	
Leek	39,047	34,000	5,047	
Lettuce heads	83,478	150,000		66,522
Parsley	4,756	2,500	2,256	
Parsnip	593	5,000		4,407
Pea	3,925	20,000		16,075
Potato sol.	230,153	350,000		119,847
Onion	35,454	75,000		39,546
Radish	4,995	4,000	995	
Rhubarb	1,021	2,500		1,479
Sweet Corn	1,285	4,000		2,715
Swiss Chard	84,451	75,000	9,451	
Tomato	20,479	48,000		27,521
Turnip	17,585	14,500	3,085	
Marrows	264	2,500		2,236
Doodo	687	500	187	
Total	1,522,441	1,850,700	43,476	372,221

Source: UG.GOV.: District Files, Kigezi.

Jinja or Fort Portal is restricted by high transport costs. Only in rare cases return freight is available and even then the transport costs are increasing the prices so much that they cannot be competitive. A market increase in demand cannot be expected at the same rate as during the last three years. Changes in consuming habits require time and are connected with the change of generations.

Only seasonal adjustments in supply can bring minor improvements in marketing possibilities. From all products only onion and potato sol. show better future marketing prospects. Whereas the onion production is limited by climatical factors in South-Kigezi, other areas in Uganda are better suited. Potato production in Kigezi could be increased considerably replacing the imports from Kenya amounting to over 6 million lbs. per year[1]. Necessary measures are:

- introducing a potato development scheme (already started in 1968/69),
- adequate variety selection for Kigezi conditions (started at Kachwekano District Farm Institute in co-operation with Makerere University College, Faculty of Agriculture),
- seed potato production,
- erection of suitable potato stores[2].

b. VEGETABLE PROCESSING FOR KIGEZI

Considering the present situation of Agriculture in South-Kigezi, vegetable growing is offering the only cash source for many holdings. Until now, no cash crop could be found offering the same yields and income possibilities. Thus thousands of farmers are waiting to be included in the Vegetable Scheme, so far due to marketing problems restricted to the existing Societies.

Most likely vegetable production for the fresh market has soon reached its culminating point in its marketing development curve. It has to be feared that it will be very difficult to achieve further expansion. A decrease in outlet possibilities has to be envisaged, in particular with regard to

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1) East Africa Department of Customs and Excise: Annual Trade Yearbook, Mombasa 1967.

2) PRODUCE MARKETING BOARD: Potato Development Scheme for South-Kigezi, Kampala 1968.

products which can be easily produced in areas nearer to the consumer centres as the example of tomato production has already demonstrated. Taking into account the ideal climatic pre-conditions for vegetable growing in Kigezi and the interest of the farmers to produce this crop, it is obvious that these capacities of South-Kigezi should be used for future developments.

Besides the development of potato production opportunities exist in the field of herb production. The possibility to erect a dehydration plant in Kigezi is under consideration since 1965. South-Kigezi has a range of indigenous drug herbs. In addition, the climate would offer ideal growing conditions for a number of exotic drug plants. First trials with herbs such as fennel, parsley, chives, basil, dill, mint, sage, thyme, marjoram, lavender, etc. showed good results. The high altitude of the area is an essential factor for the quality of any of those herbs. Not without good reasons the pyrethrum and nicotine tobacco production was flourishing in Kigezi at times of good world market.

One of the solutions for an outlet for the fresh vegetable production which would allow more farmers to enter the Scheme would be the erection of a processing plant. From the processing possibilities for vegetables:

- canning
- deep freezing
- pickling
- dehydration and freeze drying

with regard to the landlocked situation of Kigezi and the smallholder production, processing by dehydration would be most advisable. The success of any processing industry depends on three

main factors[1]:

- the production of raw material,
- the processing plant planned to be technically perfect producing the right products at competitive costs,
- the market outlet for the products.

Although the Kigezi project would have the chance to overcome the production and processing problems the task to find reliable market outlets covering the production costs proved to be the most limiting factor. When judging this project main emphasis has to be laid on the social aspects such a plant could have for the smallholders in the area, but it would be unrealistic to build up a project which is due to fail because of unsecure market demand.

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1) H.J. MITTENDORF: Marktwirtschaftliche Betrachtungen bei der Planung landwirtschaftlicher Verarbeitungsunternehmen in Entwicklungsländern. Agrarwirtschaft, Hannover, Jahrgang 16, Heft 17. 1967.

D.G.R. BELSHAW: Agricultural Processing, Export Earnings and Import Substitution, some Economic Issues. Crop and Livestock Provessing Seminar, Makerere University College and FAO, Kampala 1967.

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E. RESULTS AND EFFECTS OF THE KIGEZI VEGETABLE SCHEME

I. GENERAL EFFECTS ON THE DISTRICT

The successful project of vegetable growing and co-operative marketing is one of the outstanding agricultural achievements of the Kigezi District and its farmers. The farmers in Kigezi thus have been able to prove that they are willing and capable of making best use of aid, advice and support given to them. These results created at all governmental departments and foreign agencies a positive interest and a responsive atmosphere for matters concerning Kigezi.

1. THE CO-OPERATIVE EXAMPLE

Despite the negative predictions the Kigezi Vegetable Growers developed into a positive co-operative example in the district within three years (1965-1968). The co-operative extension work developed under the following guideline:

- To incorporate the local communal activities the present population is still practising.
- The farmer himself remains independent. He decides for himself whether or not to join co-operative activities.
- The farmer is given only advice. He himself must decide on the techniques and measures suitable for him.
- The co-operative idea has not been emphasised. The vegetable growers showed their own initiative when they came together in 1953 to start co-operation. Their intention was fulfilled in 1961 when they formed the first co-operative in Kigezi.
- The vegetable farmers experienced a prolonged period of development. They underwent the stages of private marketing (before 1951), marketing by a private enterprise (1951-1961) and gathered all the experiences of bad and unhealthy co-operative self-government (1961-1965).

- A conclusion only had to be drawn from these past experiences to show the growers the proper way to new co-operatives.
- The advice was based only on existing results. Nothing was used which could have been regarded as irrelevant material.

The Co-operative Department has now in Kigezi positive examples at hand with which they can stimulate the ambitions of the other co-operatives. Already improvements can be noted within the coffee and tobacco co-operatives.

The results of the "Kigezi District Vegetable Growers Co-operative Union Ltd." might be of direct value for the co-operatives as a whole, as the results have been obtained under the most difficult production and marketing conditions.

2. THE EXAMPLE OF AGRICULTURAL INTENSIFICATION

The fact that vegetable growing is a horticultural enterprise illustrates that the farmers have to practise more specialised agriculture. They must be open to new techniques, careful in selecting the plot, preparing a seedbed, planting at different distances, planting in rows, cultivating and harvesting in time and this in respect to over 30 different varieties. The quality regulations and the price policy demand a certain flexibility and active concern in the matters of the community. The growers naturally extend their knowledge on other crops, e.g. they belong to the few holders using row planting for maize, sorghum, beans, etc. Their example influences relatives, friends and neighbours. The Vegetable Scheme with its methods of extension work affects the whole agricultural sector in Kigezi. The good response by the farmers proves the soundness of the approach chosen.

3. THE EXAMPLE OF POLITICAL AND RELIGIOUS CO-OPERATION

The activities of the Vegetable Scheme could also point out possibilities and examples of co-operation on fields not directly related with agriculture. After years of religious and political quarrels and intrigues the Vegetable Scheme started in 1965 to overcome those differences. Today, members of all religious and political divisions are working together on a neutral and mere technical basis. The Kigezi Vegetable Union was the first organisation in Kigezi covering a bigger area which was able to neutralize these factors.

4. VEGETABLE PRODUCTION IN THE CONTEXT OF THE AGRICULTURE OF KIGEZI DISTRICT

From a very sporadic beginning (1951: 40 growers) vegetable growing in Kigezi has become an important source of income in the District, especially in the mountainous southern part where other cash crops are difficult to grow. In 1967 the income from vegetable sales was already ranging second behind coffee in Kigezi.

Table 102. Growers' Income from Different Products mainly Exported from Kigezi, 1967

Product	Shs/Year	%
Coffee	4,299,198	83.5
Vegetables	270,750	5.3
Tea	251,739	4.9
Tobacco flue cured	190,800	3.7
Castor Seed	73,360	1.4
Cotton	44,072	0.9
Potato sol. a)	15,680	0.3

a) Potatoes sold outside the Vegetable Scheme.

Source: UG.GOV.: District Agricultural Office, Annual Report 1967.

The efforts of other areas to get permission of joining the Vegetable Scheme indicates the high attraction of vegetable growing as a cash crop in the district.

II. CO-OPERATIVE RESULTS

1. THE KIGEZI DISTRICT VEGETABLE GROWERS CO-OPERATIVE UNION LTD.

Table 103 provides a picture of the most important results within the Kigezi Vegetable Union development from 1965 to 1968.

Table 103. Developments of the Kigezi Vegetable Union 1965 - 1968

Development	1965	1968	Increase %
Co-operative Members	1,431	2,171	+ 51.7
Kinds of Vegetable produced	21	33	+ 57.1
Vegetables bought in lb.	1,384,464	3,255,795	+135.2
Income of Growers in Shs.	179,717	352,454	+ 96.1
Number of Tender Contracts	40	96	+140.0
Number of Selling Places	1	5	
Approx. Union Capital in Shs.	30,000	100,000	+230.0

Source: UG.GOV.: District Files, Kigezi.

With these achievements the Union has fulfilled its expectations. The most limiting factor which remains to be solved in the future is the staff problem especially on the management level where honest and capable manager are lacking. Any future development of the Kigezi Vegetable Union will depend upon how this problem can be solved.

2. THE PRIMARY SOCIETIES

The Primary Societies had started with a loan by the Union for their first vegetable purchases from the farmers. Table 104 and 105 illustrate their developments.

Table 104. The Development of the Primary Societies between 1965/66 and 1967/68

Society	Members		Vegetable Kinds		Turnover Shs	
	+	%	+	%	+	%
Bubale	35.5		57.9		50.1	
Muyumbu	17.8		57.9		28.7	
Kabanyonyi	75.0		66.7		47.3	
Nyansha	11.8		47.4		22.0	
Kyobugombe	17.8		55.6		12.9	
Bukinda	64.7		70.6		61.0	
Rutobo	44.7		93.8		80.8	

Source: UG.GOV.: District Files, Kigezi.

Table 105. The Development of Capital of the Primary Societies, 1965 - 1968

Society	1965/66 Shs	1966/67 Shs	1967/68 Shs
Bubale	4,279.00	5,763.20	6,544.55
Muyumbu	3,731.25	7,757.40	13,201.80
Kabanyonyi	2,671.45	5,706.55	10,920.75
Nyansha	2,654.05	5,339.10	7,522.50
Kyobugombe	4,156.70	12,226.45	18,899.30
Bukinda	3,460.85	8,497.00	11,005.95
Rwamucucu Branch	-	-	988.15
Rutobo	2,025.20	5,308.45	8,709.60
Total	22,978.50	50,598.15	77,792.60
Increase	22,978.50	27,619.65	27,194.45
Associated Societies:			
Kahungye	-	-	3,800.00
Bwindi	-	-	600.00
Kashenyi/Muko	-	-	2,300.00
Total	22,978.50	50,598.15	84,492.60

Source: UG.GOV.: District Files, Kigezi.

In three successive years 1965 to 1968, the members of the Primary Societies decided not to distribute the Society's profits[1]. During the years the members learnt to realize more and more the power of their votes. The election of their representatives develops methods of sound selection of the most capable members. Nearly all markets eliminated selfish, narrow-minded and intolerant leaders who were not willing to serve all equally. The Kigezi District Annual Report 1968 for Agriculture comments: "... the relation between the various committees and members was stronger than ever before resulting in all committee members of all societies being re-elected."[2]

The policy to turn out the Primary Societies as a stable element within the structure of the whole co-operative set-up has succeeded. This co-operative nucleus to which the individual member has direct contact is the representative in his eyes of the co-operative idea as a whole. It is the criterion of reliability and success. The Union system has been consequently aligned in such a way that in the Primary Societies losses should not occur. It is far more essential for the grower that his Primary Society is making profit and can offer him an annual bonus than an increase of one cent per pound of his producer prices during the year.

III. EFFECTS OF VEGETABLE GROWING ON FARM MANAGEMENT AND RETURNS

1. THE STATUS OF VEGETABLES WITHIN THE FARM MANAGEMENT

Vegetable production occupies an exceptional position within a holdings' agriculture. In most families the head remains responsible for growing vegetables and for their marketing. An exception can be found in Kabale area where the wives of govern-

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1) Nyansha Society distributed half of the profits for 1965/66.

2) UG.GOV.: Kigezi District Agricultural Annual Report 1968, p.11.

mental employees, etc. have started gaining an additional income from their house garden production for their own disposal. Vegetables thus have gained the same status symbol so far only held by coffee. The fact that vegetable growing is given this importance, however, stimulates women and teenage children to the point of their eagerly learning necessary methods and cultivation measures. Vegetables are the favoured subject in the Young Farmer Movement.

Vegetables are given first choice in the site selection and it is besides coffee the only crop where compost or manure is applied, or where row planting is common.

2. RETURNS FROM VEGETABLE GROWING

Of 69 per cent of the farm holdings examined, all being members of the Kigezi Vegetable Scheme, vegetable sales are the main item among returns. The obvious increase of the income group between Shs. 100 and 500 and the relative decrease of members earning between Shs 0 and 50 is revealing an encouraging trend. The declining figure of farmers with more than Shs. 500 gross returns has to be seen in the light of rising membership. The new members naturally cause an increase on the lower income groups at first. The example of Kabanyonyi Society clearly shows changes taking place among the different gross return groups between 1965 and 1968.

Table 106. Minimum and Maximum Annual Gross Return from Vegetables of the Holdings Analysed

Year	Bubale Shs	Muyumbu Shs	Kabanyonyi Shs	Nyansha Shs
1965/66	1.30-1747.90	0.40-814.35	0.50-1282.05	-
1966/67	0.50-1740.50	0.25-647.45	1.50-1317.85	-
1967/68	1.80-2012.15	-	1.80-1625.00	0.25-1254.40

Source: Author's investigations from the Primary Society books.

Table 107. Development of the Average Gross Return from Vegetable Growing per Farmer and Primary Society 1965 - 1968 in Shs.

Society	Average Income from Vegetable Sales in Shs a) 1965/66	1966/67	1967/68
Bubale	130.40	204.50	177.90
Muyumbu	107.70	131.70	123.80
Kabanyonyi	145.40	163.10	136.00
Nyansha	105.10	148.90	134.40
Kyobugombe	204.60	205.30	216.70
Bukinda	105.50	129.90	143.00
Rutobo	152.30	186.30	221.10
Total Average	136.60	168.00	163.70

a) Only from members with production. Non-productive members are excluded.

Source: UG.GOV.: District Files, Kigezi.

3. FARM RETURNS OF THE VEGETABLE GROWERS COMPARED WITH THEIR RETURNS FROM VEGETABLES

The following chapter gives a general review of farm income and expenses on the holdings within the Vegetable Scheme. Information given was obtained through discussions, interviews and observations by the extension service of the Vegetable Scheme over a period of three years. In order to be able to compare the data a final questionnaire was used by the author. On purpose only average data mainly based on the information of 25 farmholdings of typical vegetable growers scattered over the vegetable growing area in Kigezi as shown in table 108 are given. They were selected from over 70 questionnaires. These holdings are representing progressive and interested vegetable growers who were able to understand the questions and whose information proved to be the most reliable ones. This is demonstrated by the average income from vegetable growing of this group:

- Average income from vegetable growing of all vegetable growers: Shs. 163.70
- Average income from vegetable growing of the 25 selected holdings: Shs. 241.80
- Average income from vegetable growing of the committee members: Shs. 363.20

In this context some remarks about information obtained by questionnaires etc. from African illiterate smallholders have to be noted:

- Generally all farmers' statements must be used critically. A typical example within the Vegetable Scheme was the comparison of the farmers' information about their income from vegetable growing with the true data obtained from the Society books. Two thirds of the farmers were overestimating their returns some of them up to 200 to 300 per cent.
- Figures over one thousand are incomprehensible conceptions for most of the farmers who mostly have only a poor or no educational background.
- Farm holdings or plot sizes are not known in acres etc. only in the number of plots. When visiting and measuring these plots not seldom land disputes arose with neighbours or other family members who claimed to own the plot in question as well.
- Statements made by the head of the family are only relevant for his own income or the income of the family members he had learned about. But as the wives can often dispose of the crops grown at their own fields, particularly in the case of several wives, the husband cannot provide exact data. Results from separate discussions with the women showed that their additional income averages Shs. 50 to 100 per year mainly from eggs, poultry, beer, etc.

- Questions such as annual expenses for clothes, etc. are difficult to answer not only for an illiterate farmer. Private discussions often revealed that the information given to such questions had been only guessed.

These and many more experiences resulted in the decision not to expose a mass of data about farm economics within the Vegetable Scheme which had to be based on unreliable information. Therefore, only average figures are given expressing the present situation within the area. Data obtained from a group of committee members who can be regarded as the most active and progressive members are included as well.

Inquiries among vegetable growing holdings showed average gross returns from general agriculture of Shs. 1,771.70. This is Shs. 450.00 per acre. When comparing the average gross return of Shs. 1,771.70 with the average cash income from general agriculture of Shs. 480.00 Shs. 1,291.70 are left for subsistence food consumption. Taking an average size of family with eight members into account these are Shs. 0.44 per person and day. The gross returns from vegetables of Shs. 241.80 are 33.5 per cent of the total cash return[1].

Within the group of committee members the gross returns from vegetables of Shs. 363.20 are 45.1 per cent compared with the income from general agriculture and due to the additional non-agricultural income sources as committee allowances and trading returns 29.7 per cent of the total cash income of Shs. 1,220.70.

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1) H. RUTHENBERG (Ed.): Smallholder Farming and Smallholder Development in Tanzania. München 1968, p.158.

Table 108. Data of 25 Farmholdings with Vegetable Production

No.	Area	Acres	Family Members	Man Equivalent (a)	Livestock Units (b)	Building Capital Shs	Movable Capital Shs	Gross Return Vegetables Shs	Gross Return Other Crops + Livestock	Total from Agriculture Shs	% of Total
1	Bu	8.10	8	4.70	1.45	2,860	150	640.40	1,000.00	1,640.40	39.0
2	Bu	2.10	5	1.85	-	830	83	2.30	405.00	407.30	0.5
3	Bu	3.51	10	5.20	4.00	830	175	127.85	1,050.00	1,177.85	10.8
4	Bu	2.70	17	5.20	5.00	920	220	0.25	400.00	400.25	.
5	Mu	2.16	2	1.85	1.40	830	38	43.00	230.00	273.00	15.7
6	Mu	3.60	10	5.20	-	860	145	595.70	800.00	1,395.70	42.6
7	Mu	5.40	8	4.35	1.10	1,260	113	581.40	450.00	1,031.40	56.3
8	Mu	1.78	5	2.85	0.80	460	55	97.00	360.00	457.00	21.2
9	Ka	3.78	4	1.85	-	4,720	253	627.35	450.00	1,077.35	58.2
10	Ka	2.83	11	5.20	0.20	860	93	289.25	250.00	539.25	53.6
11	Ka	3.24	14	3.55	-	1,720	75	390.75	370.00	760.75	51.3
12	Ka	3.42	3	1.85	2.30	430	28	0.40	330.00	330.40	0.1
13	Ny	4.56	10	3.85	1.00	830	73	25.30	1,070.00	1,095.30	2.3
14	Ny	6.84	16	3.20	0.90	1,320	83	89.65	1,160.00	1,249.65	7.1
15	ny	3.42	8	4.35	-	3,920	56	122.75	280.00	402.75	30.4
16	Ky	2.70	12	1.85	-	1,260	40	52.30	220.00	272.30	19.2
17	Ky	2.20	5	1.85	-	2,060	48	20.15	350.00	370.15	5.4
18	Ky	7.20	4	2.85	1.00	950	35	218.25	820.00	1,038.25	21.0
19	Ky	4.14	9	1.85	-	860	145	420.65	520.00	940.65	44.7
20	Bk	2.92	9	1.85	-	860	123	304.15	95.00	399.15	76.1
21	Bk	1.80	4	2.70	-	1,290	28	29.00	150.00	179.00	16.2
22	Bk	2.70	11	6.55	-	890	53	264.25	300.00	564.25	46.8
23	Bk	3.54	9	4.20	1.30	430	40	117.25	500.00	617.25	18.9
24	Ru	6.00	14	2.85	1.40	1,260	153	667.75	200.00	867.75	76.9
25	Ru	3.06	5	1.85	0.35	890	45	317.90	240.00	557.90	56.9
Average		3.75	8.52	3.33	0.9	1,336	94	241.80	480.00	721.80	33.5

a) Man Equivalents: Man 16-45 = 1.00; Woman 16-45 = 0.85; Children 10-16 = 0.50
D.F. WATTS: Interrelationships and the Allocation of Scarce Labour between Competing Cash and Food Crop, Makerere University College, Kampala E.D.R.P.No. 104, p.11.

b) Livestock Units: Cows + Bulls over 2 years = 1.00; Cows + Bulls 1-2 years = 0.70; Calves + Heifers under 1 year = 0.30; Goats + Sheeps over 1 year = 0.15; Goats + Sheeps under 1 year = 0.05.

Source: Author's Investigations.

Table 109. Origin of Average Gross Returns from General Agriculture (According to case studies)

Crop	Average Number of Plots	Average Income in Shs.
Plantain	0.6	400.00
Sorghum	5.4	513.00
Maize	0.4	2.60
Wheat	0.2	8.10
Bean	1.9	59.30
Pea	2.6	78.00
Sweet Potato	2.9	163.70
Potato sol.	0.6	45.40
Coffee	0.9	154.80
Tobacco Air cured	0.3	96.00
1st Rain Total	15.8	1,520.90
Maize	4.0	26.00
Bean	2.5	78.00
Pea	0.3	9.30
Sweet Potato	1.9	107.25
Potato sol.	0.6	30.25
2nd Rain Total	9.3	250.80
Gross Return from General Agriculture:		1,771.70

Source: Author's investigations. The yields used are based on the data of the District Agriculture Office. Compared with other information (see table 28) these yields are above average.

Table 110. Average Annual Cash Income of 25 Farm Holdings with Vegetable Production

Crop	Average Cash Income Shs.	% of Income
Plantain	6.40	0.8
Sorghum	183.20	25.4
Maize	2.60	0.3
Bean	3.60	0.5
Pea	13.60	1.8
Sweet Potato	7.60	1.1
Potato sol.	7.20	1.0
Coffee	154.80	21.5
Tobacco Air cured	34.00	4.8
Forest	21.00	2.9
Milk	16.60	2.3

(cont'd)

Table 110. (cont'd)

Crop	Average Cash Income Shs.	% of Income
Livestock	4.00	0.5
Honey	1.20	0.1
Vegetables	241.80	33.5
Miscellaneous	24.20	3.5
Total Annual Cash Income	721.80	100.0

Source: Author's investigations.

Table 111. Average Annual Cash Income of Ten Committee Members of the Kigezi Vegetable Co-operatives

Income Sources	Average Cash Income Shs.	% of Income
Plantain	8.20	1.0
Sorghum	160.70	20.0
Maize	2.70	0.4
Bean	3.90	0.5
Pea	3.60	0.4
Sweet Potato	6.10	0.8
Potato sol.	5.70	0.7
Coffee	124.65	15.5
Tobacco Air cured	33.00	4.1
Forest	16.45	2.1
Milk	8.20	1.0
Livestock	7.15	0.9
Honey	2.15	0.2
Miscellaneous	60.00	7.3
	442.50	54.9
Vegetables	363.20	45.1
Annual Cash Income from farming	805.70	100.0
Committee Allowances	285.70	
Trading Activities etc.	129.30	
Total Annual Cash Income	1,220.70	

Source: Author's investigations.

4. EXPENDITURES OF VEGETABLE GROWING HOLDINGS

Tables 112 and 113 compare the expenditures of average vegetable farmers with those of committee members in the South-Kigezi vegetable growing zone.

Table 112. Average Expenditures Pattern of 25 Vegetable Growing Holdings

Expenditure	Shs/Year	% of Total
Taxes	50.20	10.4
School Fees	76.80	16.0
Clothes	120.40	25.0
Foodstuff (except Meat)	146.90	30.6
Meat	10.10	2.1
Repairs (Tool etc.)	9.90	2.1
Wages	4.80	1.0
Seed	20.80	4.4
Soap, Light, etc.	45.10	8.4
Average Annual Expenditures except beer	485.00	100.0

Source: Author's investigations.

Beer consumption has been stated as an average of Shs. 350. This figure consists on the one hand of the difference between the Shs. 485 of annual expenses and the Shs. 721.80 of annual cash income, and on the other hand this figure is part of the amount of sorghum used for subsistence food consumption of Shs. 329.80 (brewing of beer and entertaining).

Table 113. Average Expenditure Pattern of 10 Committee Members of the Kigezi Vegetable Co-operatives

Expenditure	Shs/Year	% of Total
Taxes	51.40	5.0
School Fees	237.40	23.2
Clothes	175.70	17.2
Foodstuff (except Meat)	293.60	28.7
Meat	26.50	2.6
Wages	73.60	7.2
Repairs (Tools etc.)	12.50	1.3
Seed	46.80	4.6
Soap, Light, etc.	104.00	10.2
Average Annual Expenditure except beer	1,021.50	100.0

Compared to the average vegetable growing farmer the committee members expenses mainly differ in the amount of money spent on school fees: It seems that with increasing income the share spent on school fees is also going up, a clear demonstration of the Kigezi Vegetable Scheme's value as a source of cash income for the social development of the Kigezi smallholders.

F. CONCLUSIONS

In the rural areas of Africa the consumption of indigenous, locally grown vegetables still predominates. For the supply of population centres and institutions, so called "market vegetables" improved and selected over the course of years are better suited. Therefore, these "introduced" vegetables are gaining importance with increasing urbanisation in Africa.

Due to the search for urgently needed cash crops the Kigezi District of Uganda has experienced trials and schemes in plenty. Whereas the pre-conditions for "European" type vegetable growing in regard to climate, soils and light are favourable in South-Kigezi, the questions concerning the relief, the fragmentation of holdings and the long distance to the main consumer centre, Kampala, represent serious obstacles.

So called European Vegetables have been successfully grown in South-Kigezi on a housegarden basis since the first Europeans' arrival. The Department of Agriculture started the present Vegetable Scheme in 1951. In 1961 the vegetable farmers formed the first co-operative in Kigezi. This Vegetable Society was reorganized in 1965 resulting in the formation of the "Kigezi District Vegetable Growers Co-operative Union Ltd." with seven Primary Societies.

The positive response to vegetable growing found among smallholders in Kigezi has its basis in the fact that this type of

production fitted easily into the existing system with fragmented holdings and that the people were in urgent need of cash then continuously provided and secured by the weekly markets held within the Vegetable Scheme. The positive results of the project prove that the producers' interest and their dependence on a crop can well overcome disadvantageous factors.

The relative inelasticity of demand for fresh vegetables soon set the limits of production offering only a few possibilities for expansion mainly of potatoes and onions. A further expansion of the production area complying with the desire for vegetable growing in other areas outside the present production area could only be realized in connection with a suitable processing plant.

The developments of the co-operative and the quick reaction of its members are proving that the African smallholder is equally able to adapt to new situations within relatively short periods of time if he can feel secure about the trustworthiness of a project. These psychological pre-conditions cannot be achieve only by purely technical aspects. Religious, political or social factors likewise have to be taken into consideration.

The results of production and marketing of fresh vegetables of the project shows that African marketing co-operatives have a chance to compete and are able to play an important role in the field of marketing if the necessary pre-conditions are fulfilled and their work is being adopted to their abilities and the existing conditions.

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